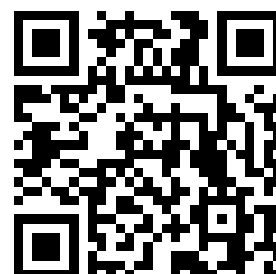

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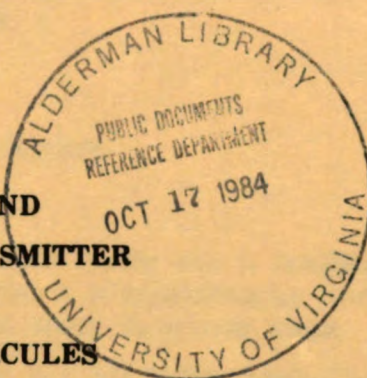
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TM 9-1430-253-34

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

DS AND GS MAINTENANCE MANUAL:
TARGET-TRACKING, TARGET-RANGING, AND
MISSILE-TRACKING ANTENNA-RECEIVER-TRANSMITTER
GROUP AND RADAR-TEST-SET GROUP
(NIKE-HERCULES AND IMPROVED NIKE-HERCULES
AIR DEFENSE GUIDED MISSILE SYSTEM AND
NIKE-HERCULES ANTI-TACTICAL BALLISTIC MISSILE SYSTEM)



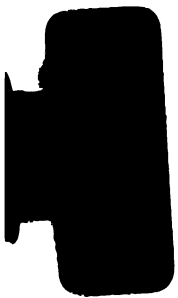
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*HEADQUARTERS, DEPARTMENT OF THE ARMY
JANUARY 1960*



WARNING



RA PD 404264

HIGH VOLTAGE

(over 500 volts)

is used in the operation of this equipment

DEATH ON CONTACT

may result if personnel fail to observe safety precautions

Never work on electronic equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who is competent in administering first aid. When the technician is aided by operators, he must warn them about dangerous areas.

Whenever possible, the power supply to the equipment must be shut off before beginning work on the equipment. Take particular care to ground every capacitor likely to hold a dangerous potential. When working inside the equipment, after the power has been turned off, always ground every part before touching it.

Be careful not to contact high-voltage connections when installing or operating this equipment.

Whenever the nature of the operation permits, keep one hand away from the equipment to reduce the hazard of current flowing through vital organs of the body.

EXTREMELY DANGEROUS POTENTIALS

greater than 500 volts exist in the following units:

- Low-power servo amplifier
- Radar test set power supply
- Radar test set pulse generator
- Target oscillator
- Test set monitor indicator panel
- Missile oscillator
- RF power meter
- Radar test set waveguide assembly
- Test set subassembly

Warning: Do not be misled by the term "low voltage." Potentials as low as 50 volts may cause death under adverse conditions.

For Artificial Respiration, refer to FM 21-11.

WARNING

RADIO-FREQUENCY RADIATION HAZARD

Radio-frequency radiations from radar antennas and associated equipment could present a potential hazard to battery personnel. The effect of RF radiation is not cumulative, but it could be hazardous. RF radiation heats the body tissues. When the intensity is high, the radiation may produce enough heat to damage the tissues permanently. Damage to the body tissue is not immediately apparent. Precautions should be taken to insure that personnel are not exposed to RF radiations of hazardous intensity levels.

A power level of 10 milliwatts per square centimeter, although not considered potentially hazardous, is stipulated by AR 40-583 as the maximum permissible exposure level for personnel subjected to RF radiation fields. Personnel should not be permitted to enter areas where they may be exposed to levels above 10 milliwatts per square centimeter.

A power density of 10 milliwatts per square centimeter is present along the axis of the transmitted beam at the following distances from Improved NIKE-HERCULES radar antennas. In each instance, the intensity rapidly diminishes as the distance is increased.

ANTENNA	DISTANCE
Radar Set AN/MPQ-43—Non Rotating	240 feet
Radar Set AN/MPQ-43—Rotating	33 feet
High Power Acquisition Radar—Non Rotating	240 feet
High Power Acquisition Radar—Rotating	33 feet
Low Power Acquisition Radar—Non Rotating	127 feet
Missile Tracking Radar—NIKE-AJAX Mode	126 feet
Target Tracking Radar—Long Pulse Mode	230 feet

Transmitting antennas in the non-scanning mode should not be positioned so as to radiate into areas occupied by passive antennas. The resulting reflections may present a potential hazard to personnel working in the vicinity of the passive antennas.

The intensity of the beam from the target tracking radar in the narrow pulse mode, from the low power acquisition radar when rotating, from the missile tracking radar in the NIKE-HERCULES mode, and from the target ranging radar is inconsequential under operating conditions.

Access to the Radar Set AN/MPQ-43 antenna trailer and the roofs of the equipment vans should be prohibited during periods of radar operation:

This information is based upon average power outputs and may be used as a guide to prevent radio-frequency radiation hazards.

FIRST AID FOR ELECTRICAL SHOCK

I. GENERAL

a. Rescue. In case of electric shock, shut off the high voltage at once and ground the circuits. If the high voltage cannot be turned off without delay, free the victim from contact with the live conductor as promptly as possible. Avoid direct contact with either the live conductor or the victim's body. Use a dry board, dry clothing, or other non-conductor to free the victim. An axe with a dry wooden handle may be used to cut the high-voltage wire. Use extreme caution to avoid the resulting electric flash.

b. Symptoms.

- (1) Breathing stops abruptly in electric shock if the current passes through the breathing center at the base of the brain. If the shock has not been too severe, the breath center recovers after a while and normal breathing is resumed, provided that a sufficient supply of air has been furnished meanwhile by artificial respiration.
- (2) The victim is usually very white or blue. The pulse is very weak or entirely absent and unconsciousness is complete. Burns are usually present. The victim's body may become rigid or stiff in a very few minutes. This condition is due to the action of electricity and is not to be considered rigor mortis. Artificial respiration must still be given, as several such cases are re-

ported to have recovered. The ordinary and general tests for death should never be accepted.

II. MOUTH-TO-MOUTH ARTIFICIAL RESPIRATION

Start artificial respiration immediately. Do not wait for a mechanical resuscitator; but when an approved model is available, use it. At the same time send for a medical officer if assistance is available. Do not leave the victim unattended. Perform artificial respiration at the scene of the accident, unless the victim's or operator's life is endangered from such action. In this case only, remove the victim to another location, but no farther than is necessary for safety. If the new location is more than a few feet away, artificial respiration should be given while the victim is being moved. Artificial respiration, once started, must be continued without loss of rhythm. The mouth-to-mouth method of artificial respiration is described here.

III. TECHNIQUE OF MOUTH-TO-MOUTH ARTIFICIAL RESPIRATION

1. Position of Victim (A). Place victim in the face upward position and kneel close to his left ear.
2. Clear the Throat. Turn the head to one side, and quickly wipe out any fluid, mucus, or foreign body from mouth and throat with the fingers.
3. Open and Aline Air Passages. Tilt the head back and extend the neck to open

and align the air passages, so that they do not become blocked by kinking or pressure.

4. Lift Jaw Forward. Place the thumb into the mouth and grasp the jaw firmly. Lift the jaw forward to pull the tongue forward out of the air passage. Do not attempt to hold or depress tongue.

5. Pinch Nostrils Closed. Use other hand to keep the victim's nostrils pinched closed to prevent air leak.

6. Form Tight Seal with Lips (B). Rescuer's wide-open mouth completely surrounds and seals the open mouth of the victim. This is not a kissing or puckered position - the mouth of the rescuer must be wide open.

7. Blow. Exhale firmly into victim's mouth until the chest is seen to lift. This can be seen by the rescuer without difficulty.

8. Remove Mouth and Breathe In (C). During this time, rescuer can hear and feel the escape of air from the victim's lungs.

9. Repeat 6, 7, and 8. Continue at a rate of 12-20 times per minute.

CAUTION: EXCESSIVELY DEEP AND RAPID BREATHING BY THE RESCUER MAY CAUSE HIM TO BECOME FAINT, TO TINGLE, AND EVEN LOSE CONSCIOUSNESS. BREATHING SHOULD BE NORMAL IN RATE WITH ONLY MODERATE INCREASE IN VOLUME. IN THIS WAY, RESCUE BREATHING CAN BE CONTINUED FOR LONG PERIODS WITHOUT FATIGUE.

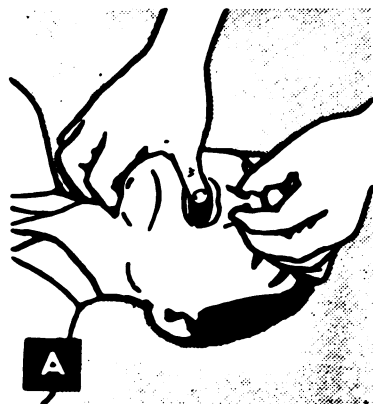
10. Remember.

a. Keep airway clear of fluid and other obstruction.

b. Readjust position if air does not flow freely in and out of victim.

c. Keep neck extended and chin pulled forward.

d. Do not breathe too forcible or too large a volume if victim is infant or small child.



RA PD 461689

TECHNICAL MANUAL

No. 9-1430-253-34

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D. C., 22 January 1960

DS and GS Maintenance Manual:

**TARGET-TRACKING, TARGET-RANGING, AND MISSILE-TRACKING
ANTENNA-RECEIVER-TRANSMITTER GROUP AND RADAR-TEST-SET GROUP
(NIKE-HERCULES AND IMPROVED NIKE-HERCULES
AIR DEFENSE GUIDED MISSILE SYSTEMS AND NIKE-HERCULES
ANTI-TACTICAL BALLISTIC MISSILE SYSTEM)**

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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. These instructions are published for the use of personnel responsible for direct support (DS) and general support (GS) maintenance of the target track, missile track, and target range antenna-receiver-transmitter groups (TTR, MTR, and TRR — fig. 2), the antenna-mast group OA-1600/T and radar test set TS-847A/MSW-1 (fig. 76), and the radar test set group (fig. 77). These instructions contain information on maintenance which is beyond the scope of tools, equipment, or supplies normally available at the organizational level.

b. Items to be removed or installed in accordance with this manual are identified by a reference number in the index. After removal, these items are normally tested in accordance with UUT procedures. For a cross-reference of reference numbers to UUT procedures, see TB 9-4900-250-35/1.

c. The instructions in this manual are intended for maintenance specialists thoroughly trained in electronics maintenance practices, but not necessarily familiar with the TTR, MTR, TRR, antenna mast group, and radar test set groups.

d. Exploded view illustrations used in this manual may show exploded parts that are not authorized for replacement and that are not involved with the depicted maintenance operation. Identification of parts on such illustrations is restricted to those parts directly involved with the depicted operation and normally includes only parts that are authorized for the specific level of maintenance.

2. Maintenance Allocation

The prescribed maintenance responsibilities apply as reflected in the allocation of maintenance parts, tools, and materials by listings in the appropriate supply manuals.

3. Related Publications

a. For a complete list of related publications (TM's, TB's, and MWO's), refer to TM 9-1425-250-L.

b. Throughout the text, specific references to other publications are provided for instructions outside the scope of this text. Table 1 indicates the appropriate reference by system type.

4. Technical Manual Effectivity

a. This manual is technically correct for all NIKE-HERCULES systems (Basic, Improved, and ATBM), provided the modification work orders (MWO's) listed on the transmittal sheet of each change have been applied.

b. There are differences among models that affect maintenance procedures. These differences exist because of production changes not covered by MWO's. These differences among models are covered in the appropriate text.

5. Nomenclature

An alphabetical listing of technical manual nomenclature, with a cross-reference to official nomenclature, is contained in the appropriate unit schematic manual (para 3).

6. Forms, Records, and Reports

Refer to TM 38-750 for instructions on the use and completion of all forms required for operating and maintaining this equipment.

7. Reporting of Equipment Publication Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, US Army Missile Command, ATTN: AMSMI-NPM, Redstone Arsenal, Alabama 35809.

NOTE: PLATFORMS MAY NOT BE
USED ON ALL SYSTEMS

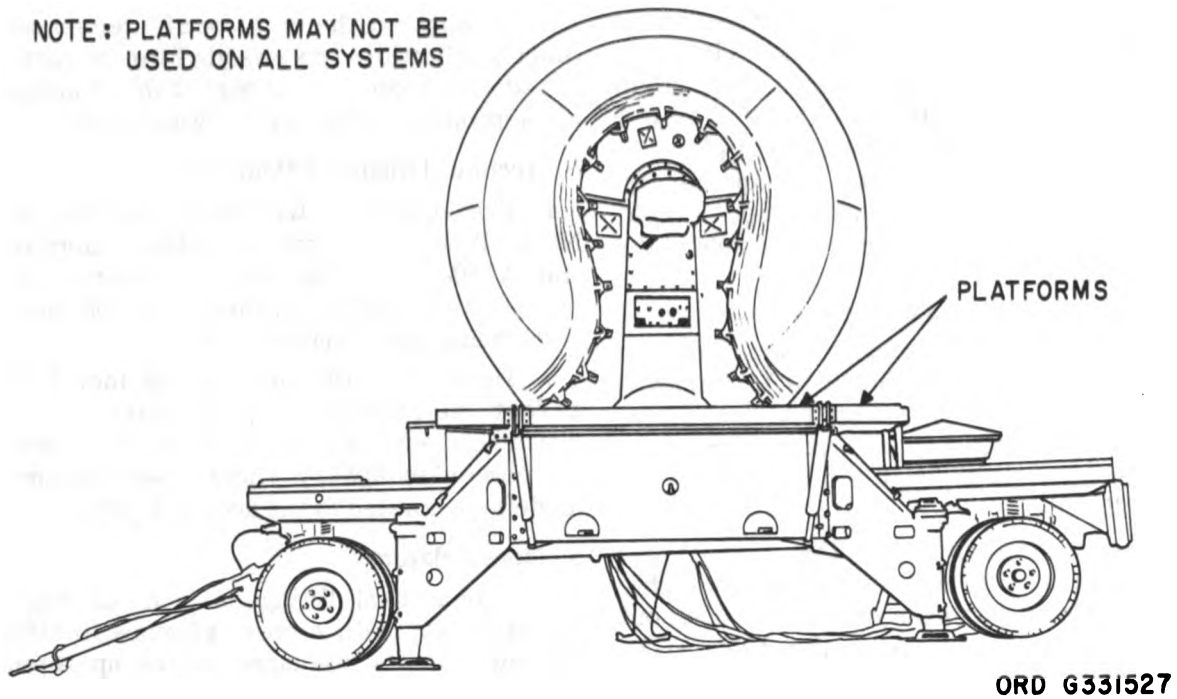


Figure 2. TTR, MTR, or TRR.

Table 1. Referenced Publications

Type publication	TM number	
	Basic systems	Improved and ATBM systems
Operator and organizational maintenance (location and access)	TM 9-1430-253-20	TM 9-1430-253-12 / 2 (ATBM) TM 9-1430-253-12 / 4 (Imp)
Assembly and emplacement	TM 9-1430-251-10	TM 9-1430-251-10
Check procedures, track	TM 9-1430-252-12 / 1	TM 9-1430-256-12 / 1
Check procedures, computer	TM 9-1430-251-12 / 1	TM 9-1430-251-12 / 1 (Imp) TM 9-1430-251-12 / 2 (ATBM)
General and preventive maintenance procedures	TM 9-1400-250-15 / 3	TM 9-1400-250-15 / 3
Component configuration	TB 9-1425-250-15 / 1	TB 9-1425-250-15 / 1
Schematics		
Unit	TM 9-1430-252-12 / 2	TM 9-1430-256-12 / 2
Functional	TM 9-1430-256-20 / 2	TM 9-1430-256-20 / 3
Theory	TM 9-1430-250-20 / 2	TM 9-1430-250-20 / 6

Section II. DATA

8. Physical Data

Table 2 lists the uncrated measurements and

weights for major items of the MTR, TTR, and TRR.

Table 2. Physical Data

Item	Length (feet)	Width (feet)	Height (feet)	Weight (pounds)	Cubical measurement (cubic feet)
Antenna-mount drop-bed trailer	28	8	3 5 / 6	5,000	859
Missile-track antenna-receiver-transmitter group	13	10 1/2	14	7,200	1,911
Target-track antenna-receiver-transmitter group	13	10 1/2	14	7,200	1,911
Target-range antenna-receiver-transmitter group	13	10 1/2	14	12,500	1,911
Trailer-mounted missile-track antenna-receiver-transmitter group	28	8	14	12,200	3,136
Trailer-mounted target-range antenna-receiver-transmitter group	28	8	14	7,500	3,136
Trailer-mounted target-track antenna-receiver-transmitter group	28	8	14	12,200	3,136

9. Electronic Data

Electronic data for the TTR, MTR, and TRR are contained in the associated theory manual (para 3).

Tables 3 through 5 (Deleted).

10. Manufacturers' Prefix Numbers

Manufacturers' prefix numbers used in this

manual are as follows:

57163 L. S. Starrett Co.
121 Crescent Street
Athol, Mass. 01331

64959 Western Electric Co.
83 Maiden Lane
New York, New York 10058

Section III. (Deleted)

CHAPTER 1.1

PARTS, SPECIAL TOOLS, AND EQUIPMENT

11.2. (Deleted)

11.3. Parts

Maintenance parts are listed in the appropriate supply manuals which are the authority for requisitioning replacement parts. Refer to TM 9-1425-250-L for a listing of appropriate supply manuals.

11.4. Common Tools and Equipment

Standard and commonly used tools and

equipment having general application are listed in current appropriate supply manuals and tables of organization and equipment (TOE).

11.5. Special Tools and Equipment

The special tools and equipment listed in table 6 are necessary to perform the maintenance described in this manual.

Notes. The tools and equipment listed in table 6 were originally furnished as accessory kit 1430-624-4360 for use with MWO ORD Y26-W2.

Table 6. Special Tools and Equipment

Item	Mfg or ref no.	Reference		Use
		Fig.	Paragraph	
Gage, locating, for RF unit ¹	81849-RN504174	2.3	51.2p	To aline monopulse duplexer.
Gage, telescoping 1/2 to 3/4	57163-No. 579-B	2.4	51.2l	To aline antenna support to track receiver-transmitter housing.
Tool, holding	64959-C632531	2.4	51.2m	To position and hold monopulse duplexer against flange on modulator housing.

¹ Not all locating gages are equipped with cam lock screw handles.

11.5.1. Expendable Materials

Expendable materials, where corrections are required, are listed in table 7 under the national

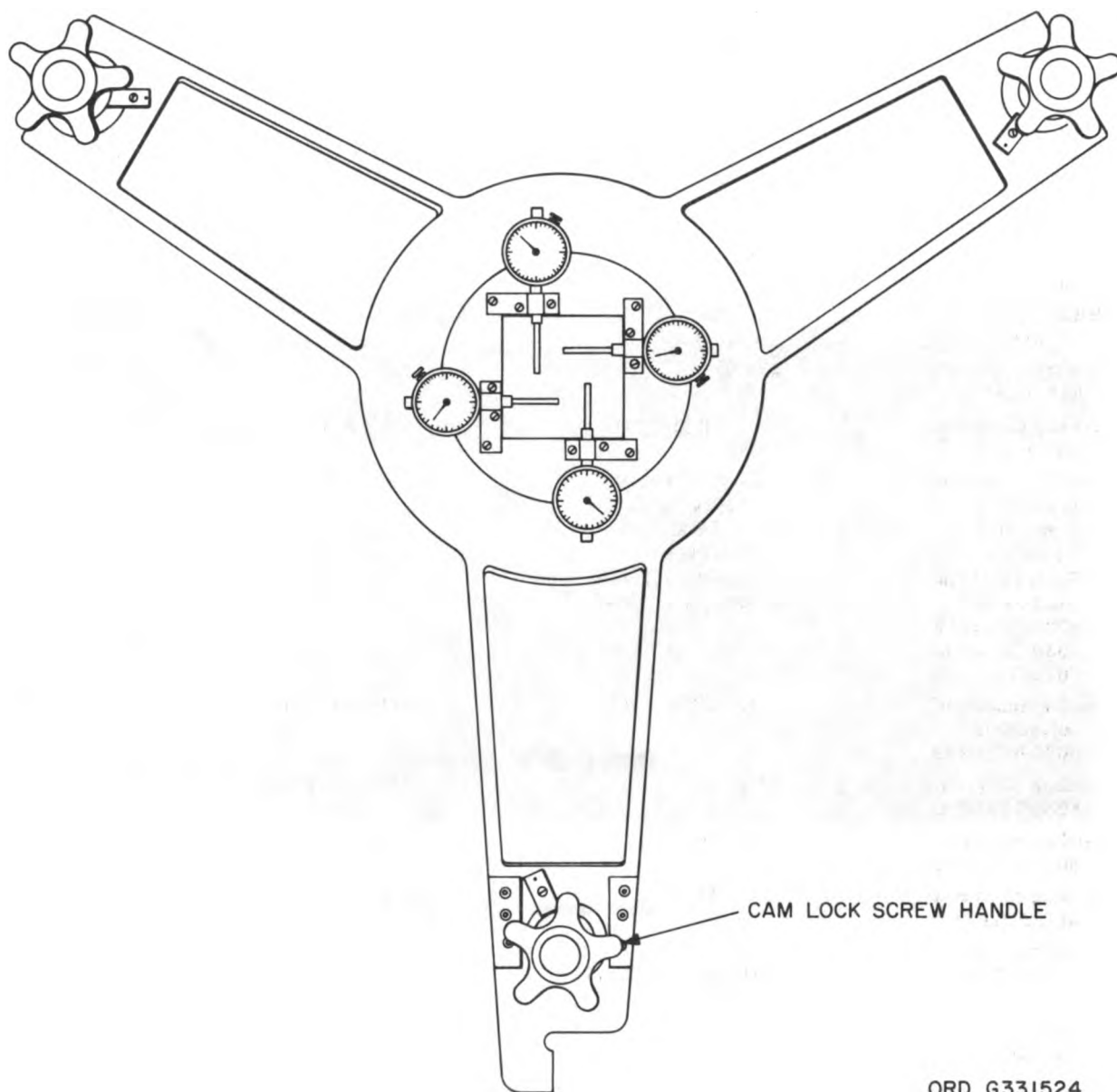
stock numbers (NSN). Paragraph references are provided where these materials are used. In some cases, these materials are updated, corrected, or changed as called for in the text.

Table 7. Expendable Materials

Material(s) called for	Para ref	Material to be used	NSN
Adhesive MIL-A-25457	171b(1), 172	Adhesive	8040-00-721-9091
Adhesive, rubber, 8024365	16a(4), 16b(6)	Adhesive, rubber	2240-00-366-1247
Adhesive, synthetic, rubber-to-steel, 52C1567-50	39b(2)	Adhesive	8040-00-221-3811
Antiseize compound 8030-251-3983	53b(3) (Note), 190d(3)-(6), 190d(8)	Antiseize compound	8030-00-274-4170
Corrosion preventive compound MIL-C-11796A, class 3	26b(2), 26b(4)	Corrosion preventive compound	8030-00-285-1570
Grease, aircraft 9150-269-8255	35.1.1b(3)	Grease, aircraft	9150-00-269-8255

Table 7. *Expendable Materials* — Continued

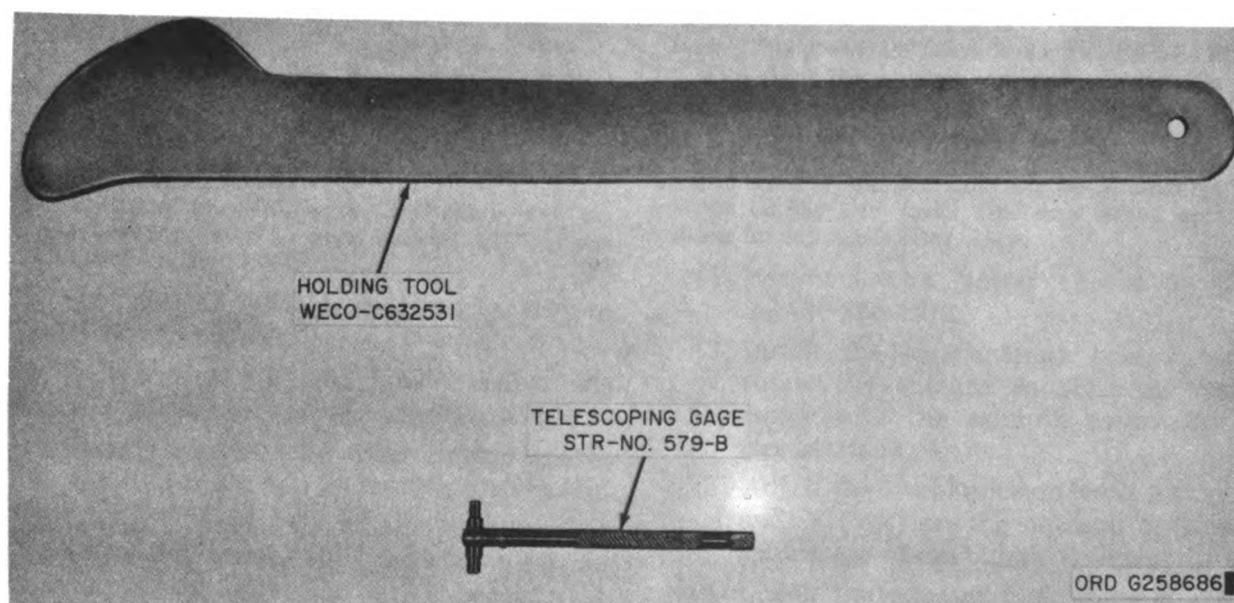
Material(s) called for	Para ref	Material to be used	NSN
Grease 9150-261-8298 9150-985-7246	14c (Note 1), 29c (Note), 78b(2)(d), 78c(2) (a), 78c(2)(d), 79c(1), 80b(1), 190c(17)	Grease	9150-00-753-4588
Grease, aircraft and instrument MIL-G-23827 MIL-G-23827A	18b(1), 19b(1), 166c(11)	Grease	3110-00-903-5526
Grease, special purpose DC 33	26b(1)	Grease	9150-00-223-4019
Sealer (8030-507-3154)	15d(2), 15d(5), 16b(5)	Sealer	8030-00-507-3154
Sealer 8175965	19b(2)	Sealer	8030-00-631-5779
Sealing compound MIL-S-7124	29c(13), 29c(20), 43c(4)	Sealing compound	8030-00-262-9041
Sealing compound Antiseize compound TT-A-580 Gasket forming compound 8030-893-4816 8030-251-3983 7612874	52b(2), 53b (Note), 53b(3)(Note), 70.48c(2), 70.49c(1), 70.49c(1) (Note), 191d(2)(c)(Note)	Tape, antiseize	8030-00-889-3533
Sealer compound, polysulfide 8030-631-5779	54c(1), 78b(2)(c)	Sealer compound	8030-00-631-5779
Sealing compound 8030-174-2599	51.2 e.1	Sealing compound	8030-00-174-2599
Sealing compound 8030-275-8110	55b(2) (Note)	Sealing compound	8030-00-275-8110
Sealing compound MIL-S-11031	171b(3)	Sealing compound	8030-00-537-7925
Sealing compound MIL-S-7502	190d(1), 191d(2)(c)(Note), 193c(5), 193(c)(6), 194c(1)	Sealing compound	8030-00-069-3311
Varnish 7612884	15d(3)	Varnish	5770-00-061-1974



ORD G331524

Figure 2.3. Locating gage 81349-RN504174.

10.1/(10.2 blank)



■ *Figure 2.4. Special tools.*

CHAPTER 1.2

CHECKS AND ADJUSTMENTS

11.6 General

This chapter contains checks and adjustments which must be performed by direct- and general-support-maintenance personnel to ensure proper system operation. Paragraphs identified with an M contain checks which must be performed every 30 days, while the paragraphs identified with an NP contain checks which are performed as required.

Note. If MWO 9-1430-253-50/2 has been applied, paragraphs 11.7 and 11.8 may be performed on a non-periodic basis.

11.7 Mechanical Checks (M)

Note. This procedure is the same for the missile tracking (MTR), target tracking (TTR), and target ranging radars (TRR).

a. Set the ANTENNA switch (fig. 49) to DISABLE.

b. Enter the pedestal, and remove the eccentric subassembly access cover (fig. 29).

c. Clean all grease and other foreign matter from the cam roller and its running surface (fig. 68).

d. Manually rotate the pedestal until an eccentric subassembly (fig. 68) is beneath the opening.

e. Adjust the eccentric subassembly for a clearance of 0.004 ± 0.001 inch between the cam roller and its running surface.

f. Coat the cam roller of the eccentric subassembly with a light coat of grease 9150-00-753-4588.

g. Repeat d through f above for the remaining 11 eccentric subassemblies.

h. Install the eccentric subassembly access cover.

i. Remove the bottom access cover assembly (R, fig. 64).

j. Adjust the stud (6, fig. 67) for a clearance of 0.002 minus 0.001 plus 0.000 inch between the bearing (7, fig. 67) and the inside of the azimuth-drive gear (A, fig. 64).

k. Repeat j above for the remaining three gear-case assemblies.

l. Install the bottom access cover assembly.

m. Set the ANTENNA switch to NORMAL.

11.8. Electrical Checks (M)

a. Perform the level checks on the MTR and TRR.

Note. This procedure is the same for both the MTR and TRR using the controls and indicators peculiar to each. This procedure should be performed during a period of low temperature gradient (early morning). To obtain a greater accuracy from the levels, approach all readings on the counter from the same direction of rotation on the level knob. One man should take all readings for any one leveling check.

(1) Perform the power checks in TM 9-1430-256-12/1.

(2) Install the local antenna control, and rotate the antenna to align the latch recess with the azimuth antirotational (transit) lock.

(3) Adjust the level knobs on levels A (right) and B (left) on the antenna until the split image of the bubble is aligned.

(4) Check the counter indications at eight positions 45 degrees apart. The maximum allowable variation between any two readings is three divisions.

(5) Remove the local antenna control.

b. Perform the level checks on the TRR.

Note. This procedure should be performed during a period of low temperature gradient (early morning). To obtain greater accuracy from the levels, approach all readings on the dial counter from the same direction of rotation on the level knob. One man should take all readings for any one leveling check.

(1) Perform the power checks in TM 9-1430-256-12/1.

(2) Install the antenna test set, and rotate the antenna to align the latch recess with the azimuth antirotational (transit) lock.

(3) Perform the procedures in a(3) and (4) above.

(4) Remove the antenna test set.

11.9. High-Power Servo Amplifier (HPSA) Strapping Check (NP)

Note. This procedure is the same for MTR, TTR, and TRR using the controls and indicators on the TTR.

a. On the radar power control-indicator, set the TARGET-PLATE VOLTS switch to off (down).

b. On the TTR antenna, remove the straps from the terminal board on the high-power servo amplifier (HPSA) to be checked.

Caution: Mate the capacitor value markings on the switch box with those on the HPSA.

c. Install switch adapter 7616378 to the terminal board on the HPSA, and set all switches to the switch adapter to off (down).

d. On the radar power control-indicator, set the TARGET-PLATE VOLTS switch to on (up).

Note. If an elevation HPSA is to be strapped, omit c and f below. If an azimuth HPSA is to be strapped, omit g through j and p below.

e. Install the local antenna control.

f. On the TTR antenna, align the latch recess with the azimuth antirotational lock, and lock the antenna in azimuth.

g. At the antenna support base, set the ANTENNA switch to DISABLE.

h. Manually move the antenna in elevation to 0 mil, lock the antenna, and set the ANTENNA switch to NORMAL.

i. Connect a lead between terminals 189 and 190 in the antenna pedestal.

j. Install the local antenna control.

k. Connect a multimeter between the test point associated with the HPSA and NEUT.

l. Adjust the fine control knob on the local antenna control to obtain a null; then, adjust it to obtain an indication of 35 volts ac on the multimeter. Leave the knob in this position.

m. On the switch adapter, set S4 to ON. Try all combinations to maximize the indication on the multimeter. Record the switches that are set to ON.

n. On the radar power control-indicator, set the TARGET-PLATE VOLTS switch to off (down).

o. Remove the switch adapter, and install the permanent straps as follows:

(1) If S1 was ON, strap the 1 μ f terminal to the 8 μ f terminal.

(2) If S2 was ON, strap the 1 μ f terminal to the 8 μ f terminal.

(3) If S3 was ON, strap the 5 μ f terminal to the 8 μ f terminal.

(4) If S4 was ON, strap the 2 μ f terminal to the 8 μ f terminal.

p. Remove the connection between terminals 189 and 190.

q. Remove the local antenna control.

r. Unlock the antenna in azimuth and elevation.

s. On the radar power control-indicator, set the TARGET-PLATE VOLTS switch to on (up).

11.9.1 Azimuth and Elevation Drive Motor Check (NP)

Note. This procedure is the same for the MTR, TTR, and TRR using the controls and indicators peculiar to each.

a. Elevate the antenna to approximately 1600 mils.

b. Disable the antenna, install the local antenna control, and remove elevation HPSA's 2 through 4.

Note. HPSA's are located on four slides in the azimuth drive equipment enclosure. Elevation HPSA's 1 through 4 are located and identified on the lower two slides, and azimuth HPSA's 1 through 4 are located and identified on the upper two slides.

c. Enable and position the antenna to approximately 2400, then 800 mils while observing the smoothness of traverse. The antenna should move smoothly between the established limits.

d. If vibrations or other symptoms of malfunction occur, return the antenna to 1600 mils, disable the antenna, and replace HPSA-1 with one that is known to be operational.

e. Repeat c above. If vibrations or evidence of malfunction still occur, troubleshoot the associated drive motor and feedback loop.

f. Disable the antenna, remove HPSA-1, insert HPSA-2, and repeat c through e above. Continue until all four drive motors have been checked.

g. To check the azimuth drive motors, repeat the procedures above using the azimuth HPSA's and moving the antenna in azimuth through a 1600-mil angle.

11.9.2 TTR, MTR, and TRR Azimuth and Elevation Tachometer Feedback Zero Adjustment (NP).

Note. These procedures are written for the TTR.

a. On the radar power control-indicator, energize the TTR system through standby (TARGET-PLATE VOLTS off).

b. On the target track control drawer, set the MAN-AID-AUTO switches to MAN and open the drawer.

c. Connect a Tektronics 454 oscilloscope, or equivalent, equipped with a 10:1 probe, from ground to BAL R4, pin 2, and adjust BAL R4 for zero volts ac.

d. Connect the oscilloscope between terminal 7 and ground on B1 on the azimuth handwheel assembly. A complex waveform will be observed with an amplitude of 125 mv or less (ignore sharp voltage spikes). If more than 125 mv is indicated, remove the snapping from the back of B1 and rotate the backplate for a minimum ac voltage indication. Replace the snapping carefully so as not to disturb the minimum reading obtained. Still monitoring between terminal 7 and ground, rotate the handwheel briskly. More than 4 volts ac should be generated.

e. Check between terminal 7 and ground on B6 on the azimuth intermediate drive control for voltage indications as in d above. Adjust the backplate if necessary. To check the output, set the target MAIN POWER switch to off, disconnect the lead from terminal 7 of B6, and monitor terminal 7 with the oscilloscope. Set the TARGET POWER and TARGET-PLATE VOLTS switches to on (up), give the handwheel a twist, and check B6 for an output of more than 4 volts ac. Set the TARGET POWER and TARGET-PLATE VOLTS switches to off, and reconnect the lead to terminal 7. Set the TARGET POWER switch to on (plate volts off).

f. With the oscilloscope, monitor the voltage at the junction of R11-R12 on the target azimuth coupling resistor assembly. There should be 125 mv or less between this point and

frame ground. Set the TARGET-PLATE VOLTS switch to on, and check for over 4 volts ac at this point when the azimuth handwheel is rotated briskly. Set the TARGET-PLATE VOLTS switch to off. Voltage indicated at this point is from the generators attached to the antenna azimuth drive motors. If more than 125 mv is indicated when the antenna is stationary, perform the procedures in (1) through (4) below.

- (1) Disable the antenna and gain access to the azimuth drive equipment enclosure by removing the bottom plate. Disconnect the yellow leads to generators B3, B5, B7, and B9.

Note. Terminal board connections and associated generators are shown below. The green wire fastens to the even-numbered connection, and the yellow wire fastens to the off-numbered connection.

<u>Terminal board connections</u>	<u>Generator</u>
TB1 - 1, 2	B3
TB2 - 11, 12	B5
TB3 - 21, 22	B7
TB4 - 31, 32	B9

- (2) Using the oscilloscope, check the yellow wire from each generator to the green wire (even-numbered) ground terminal. Peak-to-peak voltage of the complex waveform should be less than 125 mv. (Ignore the sharp voltage spikes.) If a large disparity in the voltage reading is obtained, the suspected generator should be checked with an ohmmeter. Typically, the primary should be 140 ohms, the secondary 1,700 ohms. If resistance checks indicate the generator is good, it may be adjusted for minimum output by removing the large snapping on the back and rotating the backplate as in d above.

Note. Access to the azimuth generators may be obtained by removing the inspection plate on the floor of the antenna pedestal. Access to the elevation generators may be obtained by removing the access plate on the left side of the antenna support under the receiver-transmitter housing.

- (3) As a final check of the azimuth generators, monitor the output of each one as the antenna is rotated manually. The output should exceed 4 volts.

- (4) Reconnect all generators and replace the bottom plate.

g. To check the elevation generators, monitor the voltage on the elevation resistor assembly at the junction of R12-R13 to ground with the oscilloscope. The complex waveform should have a peak-to-peak voltage of less than 125 mv. Set the TARGET-PLATE VOLTS switch to on, and rotate the antenna in elevation. The voltage indication shall be more than 4 volts. If checks of elevation generators are not as specified, perform the procedures in (1) through (3) below.

- (1) Gain access to the elevation terminal boards in the track antenna pedestal by removing the left cover plate (antenna exterior).

Note. Terminal board connections and associated generators are shown below.

<u>Terminal board connection</u>	<u>Generator</u>
TB2 - 11, 12	B4, B5
TB4 - 31, 32	B8, B9

- (2) Disconnect all yellow leads from the four generators and test in accordance with *f* (1) through (3) above.

- (3) Reconnect all leads and install cover plate.

h. To perform MTR and TRR adjustments, repeat the procedures above using associated MTR and TRR components and controls.

11.10. Azimuth and Elevation Position Transmitter Clutch-Slippage Checks (NP)

Note. If the collimation and orientation checks as prescribed in TM 9-1430-256-12/1 indicate possible clutch slippage, perform the following checks to isolate or eliminate the malfunction.

a. Remove the suspected position or correction transmitter from the tracking antenna in accordance with paragraphs 12, 35.2, 35.3, 87, 119, or 120, as applicable.

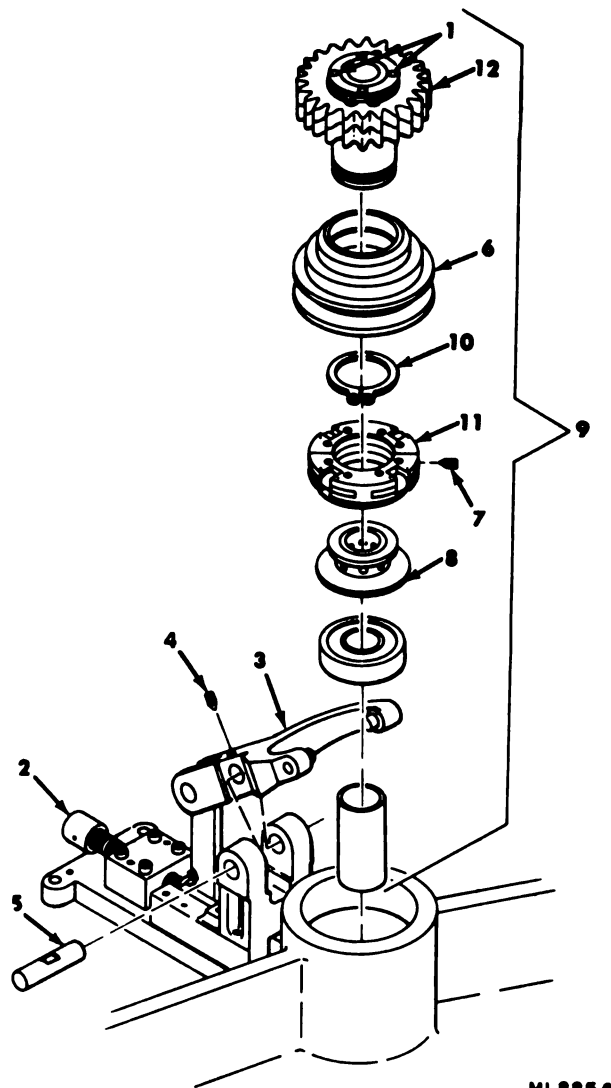
b. Set the position transmitter dials to 0.

c. Remove the zero-set index pin and coupling wrench.

d. Unscrew the guide-hole plug, and insert the zero-set index pin in the guide hole.

e. Firmly seat the zero-set index pin in the tapered notch.

f. Connect torque adapter 8031272 to the end of the gear assembly (1, fig. 2.5) with the flathead screws provided. Connect torque wrench 5120-542-4489 to the adapter.



- | | |
|---------------------------|------------------------|
| 1—Torque adapter | 7—Setscrew |
| 2—Clevis tightening screw | 8—Clutch collar |
| 3—Clevis assembly | 9—Gear-clutch assembly |
| 4—Pin-locking setscrew | 10—Inner ring |
| 5—Pin | 11—Clamp assembly |
| 6—Cup | 12—Gear |

Figure 2.5. Position transmitter slippage adjustments.

g. Apply between 100 and 150 inch-pounds in both the clockwise and counterclockwise direction to the gear-clutch assembly and observe that no slippage occurs.

h. Using the clevis-tightening screw (2), unlock the clevis assembly (3). Move the gear-clutch assembly 90 degrees, relock the clevis assembly, and repeat *g* above.

i. Repeat *h* above at the remaining two positions, which are separated by 90 degrees. If any slippage occurs, perform (1) through (4) below.

(1) Unlock the clevis assembly.

(2) Loosen the pin-locking setscrew (4) on the top of the clevis assembly, and remove the pin (5).

Note. On the MTR or TTR, remove the long nylock setscrew and inspect the set in the shaft. Ensure that the long setscrew can be seated in the shaft. If the seat is missing, oblong, or oversize, remove the gearclutch assembly, and repair in accordance with TM 9-1400-250-35/3/2.

(3) Raise the cup (6) off the collar and clamp assembly, and tighten the four setscrews (7) which hold the clutch collar (8) to the shaft. Apply sealing compound 8030-00-069-3311 to the setscrews. Release the cup.

(4) Install the pin removed in (2) above, and tighten the pin-locking setscrew on the clevis assembly.

(5) Repeat *g*, *h*, and *i* above. If slippage still occurs, replace the gear-clutch assembly, and repeat *g*, *h*, and *i* above.

Note. The gear-clutch assembly may be adjusted in accordance with paragraph 11.10.1.

j. Remove the torque wrench and torque adapter.

k. Reinstall the position or correction transmitter in accordance with paragraphs 12, 35.2, 35.3, 89, 119, or 120, as applicable.

11.10.1. Azimuth and Elevation Position and Correction Transmitter Gear-Clutch Assembly Checks (NP)

a. Release the four setscrews (7), and remove the inner ring (10, fig. 2.5) to release the clutch collar (8) with mounted clamp assembly (11).

Note. The clamp assembly is secured by one long setscrew and three shorter setscrews. When mounted on the appropriate shaft of test fixture KSMM-MAP-455 (the shafts are selected in accordance with the markings on the fixture), the long setscrew must be seated in the

drilled seat of the shaft. Inspect the shaft for a drilled seat. If it is present, omit *b* through *d* below.

b. Remove the long setscrew from the clamp assembly.

c. Position the clutch collar and clamp assembly on the appropriate shaft (clamp assembly up) with the base of the collar 2-3/16 inches from the top surface of the test fixture. Secure with the three short setscrews.

d. Mark the shaft for drilling through the remaining hole in the clamp assembly. Remove the collar and clamp assembly, and drill a 5/32-inch hole 1/8-inch deep in the shaft.

e. Position the collar and clamp assembly on the appropriate shaft (clamp assembly up) with the long setscrew hole over the drilled seat, and secure with the four setscrews.

f. Position and loosely secure the cup (1, fig. 2.6) on the adjustment tool of the test fixture using the tapered washer (2) and locking nut (3).

Note. The four clamp sections of the clamp assembly are matched and must be replaced in the original location on the clutch collar. Record the location of the sections as they are removed.

g. Remove a flathead screw to remove a clamp section from the clamp assembly. Install the clamp section (4) on the adjustment tool, and secure with the spring (5).

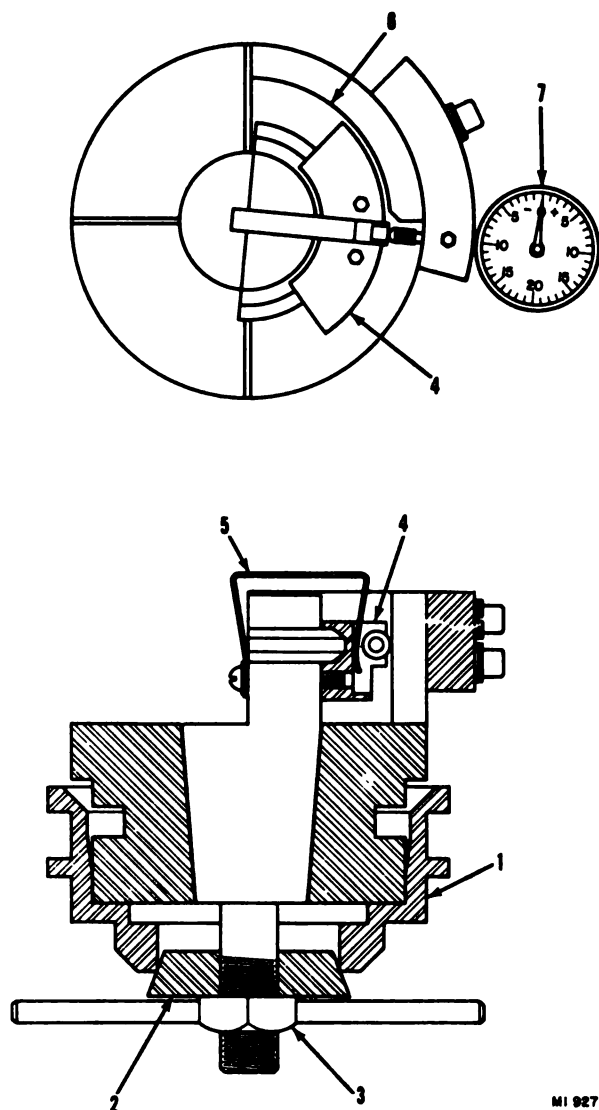
h. Position the roller of the clamp section against the center of the adjusting surface (6) on the adjusting tool; then, tighten the locking nut. Install the adjusting tool in the threaded hole of the test fixture.

i. Adjust the rollers until they are snug against the adjusting surface (interference-0.001 inch) and until the two edges of the roller press equally into the adjusting surface. The amount of pressure on the adjusting surface can be checked by pushing the clamp section from side to side. The spring allows limited freedom.

j. Tighten the top (locking) setscrews, loosen the locking nut, and free the cup. Rotate the clamp section until one side of the roller is centered over the shaft of the dial indicator (7), and tighten the locking nut. Note the dial indicator reading.

Note. When performing *k* below, reduce the depth on one side of the roller, and increase the depth on the opposite side of the roller so that the roller depth is not changed.

10.12.1



- 1—Cup (part of UUT)
- 2—Tapered washer
- 3—Locking nut
- 4—Clamp section (part of UUT)
- 5—Spring
- 6—Adjusting surface
- 7—Dial indicator

Figure 2.6. Use of test fixture KSMM-MAP-455.

k. Repeat j above at the other side of the roller. If a difference in reading is noted, release the locking setscrews, and adjust the adjusting setscrews to eliminate the difference.

l. Loosen the locking nut, and rotate the clamp section until the roller is centered over the shaft on the dial indicator.

m. Without moving the clamp section, adjust the face of the dial indicator until the reading is 0.

n. Remove the clamp section from the adjustment tool, and reinstall on the clutch collar. Use sealing compound 8030-00-069-3311 on the flathead screw.

o. Insert each of the remaining clamp sections in the adjustment tool, and adjust until the dial indicator indicates 0 at the center of the roller with equal readings on each side of the roller.

Note. See paragraph 11.10 and figure 2.5 above for assembly procedures.

Note. If the clevis-tightening screw will not rotate easily to the fully clockwise position when performing p below, the rollers are too tight. Correct by readjusting each roller for a three-increment lower (-0.0015) indication, and check adjustment of the clevis-tightening screw again.

p. Assemble the gear (12, fig. 2.5) and the cup over the clamp assembly with the clutch surface of the gear emplaced in the clamp assembly. Position and secure the actuator with the clevis (3) engaged. Rotate the clevis-tightening screw (2) fully clockwise to engage the clutch.

q. Perform the procedures in paragraph 11.10 f and g.

r. If the gear-clutch assembly does not pass the test, readjust the settings of the rollers. A one-increment (0.0005) adjustment of each roller, as indicated by the dial indicator, will result in approximately 25 inch-pounds of torque.

s. Install the gear-clutch assembly in the system, or store it as a serviceable spare as appropriate.

11.11. Transmitter Tests (NP)

a. The transmitter tests are designed to isolate the cause of a malfunction. Load tests and general isolation techniques are included. Due to the high voltages involved, final isolation of a malfunction often requires an exchange of chassis or parts, but the techniques provided in this paragraph should be used first to reduce the number of possible causes for a malfunction. Specific energized states (deenergized, low voltage, or operate) are indicated throughout the procedures. These states are defined, and

methods of obtaining them are provided in TM 9-1430-253-12/2 (ATBM) or TM 9-1430-253-12/4 (Improved).

supply, modulator, or pulse transformer. The load tests in tables 8 and 9 are provided for these chassis.

b. An unstable or weak output from the transmitter is often related to a faulty power

Table 8. Load Tests — MTR

Step	Procedure/Indication	Corrective action
1.	<p>Test the high-voltage power supply subassemblies.</p> <p>a. Deenergize the radar set.</p> <p>b. Disconnect P904 from J4 on the radar coder set.</p> <p>Warning: Voltages DANGEROUS TO LIFE exist in the receiver-transmitter. After deenergizing the radar set, use the grounding lead to discharge capacitors in the modulator section.</p> <p>c. Using a 6-inch lead with clips, strap together the negative and positive terminals of C9 in the receiver-transmitter.</p> <p>Caution: Do not rotate the HV ADJUST knob past the point where 100 ma of current is obtained.</p> <p>d. With the exception of applying high voltage (HV SUPPLY knob), energize the radar set through operate. Set the MAGNETRON switch to MA FS-100, and adjust the HV SUPPLY knob to obtain an indication of 100 ma on the MAGNETRON meter.</p> <p>The MAGNETRON meter indication is stable, and the HV SUPPLY knob has traveled less than one-half of the available range.</p>	<p>Check rectifier tubes V1 through V6 in the rectifier-power supply subassembly.</p> <p>Refer to figure 9-6 in TM 9-1430-256-12/2.</p>
2.	<p>Test the pulse amplifier tube and associated circuits.</p> <p>a. Deenergize the radar set.</p> <p>Warning: Voltages DANGEROUS TO LIFE exist in the receiver-transmitter. After deenergizing the radar set, use the grounding lead to discharge the capacitors in the modulator section.</p> <p>b. Disconnect the shorting lead across C9, and connect a shorting lead from the top bar (plate) of pulse amplifier (pulser) V1 and the rear bar (positive terminal) of C9.</p> <p>c. Reconnect P904 to J4.</p> <p>d. With the exception of applying high voltage, energize the MTR in the skin track mode. Set the MAGNETRON switch to MA FS-100, and rotate the HV SUPPLY knob to maximum while watching the MAGNETRON meter.</p> <p>The MAGNETRON meter indicates 9 to 11 ma.</p>	<p>Replace pulser V1.</p> <p>Refer to figure 9-12 in TM 9-1430-256-12/2.</p>
	<p>e. Set the MAGNETRON switch to KV FS-20.</p> <p>The MAGNETRON meter indicates less than 17.5 kv.</p>	<p>Replace pulser V1.</p> <p>Refer to figure 9-12 in TM 9-1430-256-12/2.</p>

Table 8. Load Tests — MTR — Continued

Step	Procedure/Indication	Corrective action
3.	<p>Test the pulse transformer.</p> <p><i>Note.</i> This test simulates a magnetron load.</p> <p>a. Deenergize the radar set.</p> <p><i>Warning:</i> Voltages DANGEROUS TO LIFE exist in the transmitter-receiver. After deenergizing the radar set, use the grounding lead to discharge capacitors in the modulator section.</p> <p>b. Disconnect the shorting lead from the pulse amplifier and connect a shorting lead between the shell of the electron tube coupler (fig. 43) and the rear bar (positive terminal) of C9.</p> <p>c. With the exception of applying high voltage, energize the MTR in the skin track mode. Set the MAGNETRON switch to MA FS-100, and slowly adjust the HV SUPPLY knob fully clockwise.</p> <p>The MAGNETRON meter indicates between 9 and 11 ma.</p> <p>d. Set the MAGNETRON switch to HV FS-20.</p> <p>The MAGNETRON meter indicates less than 17.5 kv.</p> <p>e. Deenergize the radar set.</p> <p><i>Warning:</i> Voltages DANGEROUS TO LIFE exist in the receiver-transmitter. After deenergizing the radar set, use the grounding lead to discharge capacitors in the modulator section.</p> <p>f. Remove the shorting strap and return the radar set to normal operation.</p>	<p>Refer to figure 9-12 in TM 9-1430-256-12/2.</p> <p>Refer to figure 9-12 in TM 9-1430-256-12/2</p>

Table 9. Load Test — TTR

Step	Procedure/Indication	Corrective action
1.	<p>Test the high-voltage power supply subassemblies.</p> <p>a. Deenergize the radar set.</p> <p>b. Disconnect P212 from J5 on the acquisition-track synchronizer.</p> <p><i>Warning:</i> Voltages DANGEROUS TO LIFE exist in the receiver-transmitter. After deenergizing the radar set, use the grounding lead to discharge the capacitors in the modulator section.</p> <p>c. Using a 6-inch lead with clips, strap together the negative and positive terminals of C9 in the receiver-transmitter.</p> <p><i>Caution:</i> Do not rotate the HV ADJUST knob past the point where 95 ma of current is obtained.</p> <p>d. With the exception of applying high voltage (HV SUPPLY off), energize the radar set through operate in the long-pulse mode. Set the MAGNETRON metering switch to MA FS-100, and slowly rotate the HV SUPPLY knob clockwise to obtain either a maximum setting or an indication of 95 ma on the MAGNETRON meter, whichever comes first.</p> <p>The MAGNETRON meter indication is stable and 90 ma or more.</p>	<p>Check rectifier tubes V1 through V6 in the receiver-power supply subassembly.</p> <p>Refer to figure 9-6 in TM 9-1430-256-12/2.</p>

Table 9. Load Test — TTR — Continued

Step	Procedure/Indication	Corrective action
2.	Test the pulse amplifier tube and associated circuits.	
	a. Deenergize the radar set.	
	Warning: Voltages DANGEROUS TO LIFE exist in the receiver-transmitter. After deenergizing the radar set, use the grounding lead to discharge capacitors in the modulator section.	
	b. Disconnect the shorting lead across C9 and connect a shorting lead from the top bar (plate) of pulse amplifier V1 and the rear bar (positive terminal) of C9.	
	c. Reconnect P212 to J5.	
	d. With the exception of applying high voltage, energize the TTR through operate in the non MP long-pulse mode, set the MAGNETRON metering switch to MA FS-100, and slowly rotate the HV SUPPLY knob clockwise to obtain either a maximum setting or an indication of 75 ma on the MAGNETRON meter, whichever comes first.	
	e. Set the MAGNETRON switch to KV FS-20.	
	The MAGNETRON meter indication is stable and 1.8 kv or less.	Refer to figure 10-4 in TM 9-1430-256-12/2.
	f. Repeat d and e above in the MP mode.	
	The MAGNETRON meter indication is stable and 2 kv or less.	Refer to figure 10-4 in TM 9-1430-256-12/2.
	g. Select MP OFF and rotate the HV SUPPLY knob to START. On the target track control-power supply, set the LONG PULSE—SHORT PULSE switch to SHORT PULSE.	
	h. Set the MAGNETRON switch to MA FS-100, and slowly rotate the HV SUPPLY knob to the fully clockwise position while observing the MAGNETRON meter.	
	The MAGNETRON meter indicates between 6 and 10 ma.	Replace pulse amplifier V1. Refer to figure 10-4 in TM 9-1430-256-12/2.
	i. Set the MAGNETRON switch to KV FS-20.	
	The MAGNETRON meter indicates 1 kv or less.	Replace pulse amplifier V1. Refer to figure 10-4 in TM 9-1430-256-12/2.
	j. Repeat h and i above in the MP mode.	
	The MAGNETRON meter indicates between 80 and 90 ma for current and at full scale for voltage.	Replace pulse amplifier V1. Refer to figure 10-4 in TM 9-1430-256-12/2.
3.	Test the pulse transformer.	
	Note. This test simulates a magnetron load.	
	a. Deenergize the radar set.	
	Warning: Voltages DANGEROUS TO LIFE exist in the receiver-transmitter. After deenergizing the radar set, use the grounding lead to discharge capacitors in the modulator section.	
	b. Disconnect the shorting lead from the pulse amplifier, and connect a shorting lead between the shell of the electron tube coupler (fig. 48) and the rear bar (positive terminal) of C9.	

Table 9. Load Test — TTR — Continued

Step	Procedure/Indication	Corrective action
3.	Continued	
c.	With the exception of applying high voltage, energize the TTR through operate in the non MP long-pulse mode. Set the MAGNETRON switch to MA FS-100, and slowly rotate the HV SUPPLY knob clockwise to obtain either a maximum setting or an indication of 75 ma on the MAGNETRON meter, whichever comes first.	
d.	Set the MAGNETRON switch to KV FS-20. The MAGNETRON meter indicates 2 kv or less.	Refer to figure 10-4 in TM 9-1430-256-12/2.
e.	Repeat c and d above in the MP mode. The MAGNETRON meter indicates 2 kv or less.	Refer to figure 10-4 in TM 9-1430-256-12/2.
f.	Rotate the HV SUPPLY knob to START and the LONG PULSE—SHORT PULSE switch to SHORT PULSE (MP OFF).	
g.	Set the MAGNETRON switch to MA FS-100, and slowly rotate the HV SUPPLY knob fully clockwise while monitoring the MAGNETRON meter. The MAGNETRON meter indicates between 6 and 8 ma.	Refer to figure 10-4 in TM 9-1430-256-12/2.
h.	Set the MAGNETRON switch to KV FS-20. The MAGNETRON meter indicates 1 kv or less.	Refer to figure 10-4 in TM 9-1430-256-12/2.
i.	Repeat g and h above in the MP mode. The MAGNETRON meter indicates between 80 and 90 ma for current and 16 kv or less for voltage.	Refer to figure 10-4 in TM 9-1430-256-12/2.
j.	On the target track antenna support base, set the TEST switch to V1 and record the TEST meter indication (MP OFF). The TEST meter indicates 2.1 or less.	Refer to figure 10-2 in TM 9-1430-256-12/2.
k.	Repeat j above in the MP mode. The TEST meter indicates 3.6 or less.	Refer to figure 10-2 in TM 9-1430-256-12/2.
l.	On the target track trigger amplifier, rotate the SHORT PULSE ADJ control fully counterclockwise and observe the power supply voltage (HV SUPPLY knob fully clockwise) (KV FS-20) and current (MA FS-100) indications (MP OFF). The MAGNETRON meter indications are between 5 and 9 ma for current and 2 kv or less for voltage.	Refer to figure 10-4 in TM 9-1430-256-12/2.
m.	Repeat l above in the MP mode. The MAGNETRON meter indications are between 65 and 75 ma for current and 16 kv or less for voltage.	Refer to figure 10-4 in TM 9-1430-256-12/2.
n.	Rotate the SHORT PULSE ADJ control fully clockwise and observe the power supply voltage (HV FS-20) and current (MA FS-100) indications in the normal and MP modes. In MP the MAGNETRON meter indication pegs when measuring current and is 11 kv or less for voltage. In normal pulse the MAGNETRON meter indications are between 6 and 10 ma for current and 1 kv or less for voltage.	Refer to figure 10-4 in TM 9-1430-256-12/2. Refer to figure 10-4 in TM 9-1430-256-12/2.

Table 9. Load Test — TTR — Continued

Step	Procedure/Indication	Corrective action
8.	Continued	
	o. Adjust the PULSE WIDTH ADJ control for the TEST meter indication recorded in <i>j</i> above.	
	p. Deenergize the radar set.	
	Warning: Voltages DANGEROUS TO LIFE exist in the receiver-transmitter. After deenergizing the radar set, use the grounding lead to discharge capacitors in the modulator section.	
	q. Remove the shorting strap and return the radar set to normal operation.	
	c. Excessive current can be caused by dc leakage, arcing, or improper triggering. Excessive dc leakage is usually indicated by a steady increase in current without erratic changes and is most evident in the dc power supply current (MA FS-100). Tests for dc leakage current are provided in (1) below. Arcing and unstable trigger problems are often reflected by unstable indications and may be more noticable in the magnetron current (MA FS-20) than in the dc power supply current. Tests for these unstable conditions are provided in (2) below.	coder set (MTR); then, remove reverse current diode V2 from the receiver-transmitter.
	(1) <i>Excessive leakage current.</i> With the triggering pulse disconnected and the maximum high voltage applied, leakage current should not exceed 5 ma. With pulse amplifier (pulser) V1 and the triggering pulse disconnected, the current should be barely discernable.	Warning: Voltages DANGEROUS TO LIFE exist in the receiver-transmitter and azimuth drive equipment enclosure. After deenergizing the radar set, use the grounding lead to discharge capacitors in the modulator section.
	(a) As a preliminary, first deenergize the radar set and disconnect P212 from J5 on the acquisition-track synchronizer (TTR) or P904 from J4 on the radar	(b) In testing, for each part indicated for disconnection in table V.3 below, deenergize the system, discharge the capacitors, disconnect the cables at the point (s) indicated, and then energize the system to 20 kv of voltage. If the excessive leakage current disappears, replace the part being tested, and return the system to normal operation. If excessive current occurs with the part disconnected, proceed to the next disconnect point.

Table V.3. Leakage Tests

<i>Disconnect point</i>	<i>Parts being tested</i>	<i>Remarks</i>
Grid, cathode and filament of pulse amplifier (pulser) V1 in the receiver-transmitter (disconnect all leads from both ends). Caution: Do not bend the strap.	Pulse amplifier (pulser) V1 and —500-volt (bias) power supply.	The output of the —500-volt power supply can be checked in the low-voltage condition.
Negative (forward) terminal of (9) in the receiver-transmitter.	(9)	Assure that the disconnected strap lead cannot arc to the chassis or parts.
Terminal 4 in the transformer and filter power supply subassembly.	Cables and slip-rings between the transformer and filter power supply subassembly and the receiver-transmitter.	Replace the items, one at a time, until the malfunction disappears.

(c) Excessive leakage not already identified is the result of a malfunction in the rectifier power supply subassembly, the transformer and filter power subassembly, the connecting cables, or the three-phase, 400-cycle circuits supplying the rectifier power supply subassembly. Exchange these items, one at a time, between the TTR and the MTR until the malfunction disappears.

(2) *Unstable (changing) current.*

(a) Missing, varying amplitude, or erratic triggering pulses can cause varying current indications. If an adequate voltage divider is available, check the HV pulse for stability in amplitude, width, and timing before assuming that there are receiver-transmitter troubles. If a voltage divider is not available, check the sync pulse.

(b) Arcing causes sudden changes in power supply and magnetron current. Arcing at the magnetron or waveguide is indicated by an increase in magnetron current, while arcing of components which supply the high-voltage pulse to the magnetron is indicated by a reduction in magnetron current. Arcing within the latter components can usually be localized by the procedures of (1) above.

CHAPTER 1.3

ACCESS PROCEDURES

11.11.1. General

Access procedures for items mounted inside the radome, including items in the RF enclosure, and the roadside and curbside equipment enclosures are provided in this chapter.

11.11.2. Radome

Warning: The track-antenna pedestal, the target-track-antenna support, and the range-antenna pedestal contain voltages DANGEROUS TO LIFE. Turn TARGET POWER switch or MISSILE POWER switch on radar-power control-indicator or TRR POWER switch on range-radar-power control-indicator, as applicable, to off position before gaining access.

a. Access.

(1) Set the ANTENNA switch (fig. 49) to DISABLE, and engage azimuth transit lock (fig. 3).

(2) Set the BLOWER switch, at the base of the pedestal group, to OFF.

(3) Open radome zipper door (fig. 3), and engage elevation lock (fig. 29).

b. Closure. To return the equipment to normal operation, reverse the procedure of a (1) through (3) above.

11.11.3. Receiver-Transmitter (RF Enclosure).

a. Main Enclosure-Access.

(1) Perform the procedures of paragraph 11.11.2 a above.

Warning: The track-or range-receiver-transmitter contains voltages DANGEROUS TO LIFE. Turn TARGET POWER or MISSILE POWER switch, on the radar-power-control panel, or TRR POWER switch on the range-radar-power control-

indicator, as applicable, to the off position. For the TTR and MTR, discharge capacitors C9, C11, C12, C15, C18, and C19.

Caution: The magnetron electron tube contains a strong magnet. Keep meters, watches, tools, and similar metallic objects at least 3 feet from the magnetron electron tube to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

Note. Assure that the antenna reflector is positioned as shown in figure 29.

(2) Release four clamps, and open the cover.

(3) To gain access to the rear of the enclosure, release two clamps (TTR or MTR), or turn the release handle to the right (TRR) and swing the track or range RF control-power supply group (fig. 30 or 48.1) to the forward (open) position.

b. Modulator (TTR or MTR).

Warning: Voltages DANGEROUS TO LIFE exist in the modulator. Use the grounded test leads (fig. 30) to discharge capacitors after releasing the cover.

Release nine modulator cover clamps, and allow the modulator cover to hang loose from the straps.

c. Closure.

To return the equipment to normal operation, reverse the procedure of a and b above.

11.11.4. Equipment Enclosures

Access to the equipment enclosures is obtained by releasing the handles and raising the doors. Brace assemblies provide support for the doors while they are open. Fasteners secure the hinged panels and doors behind the main access doors.

CHAPTER 2

MAINTENANCE OF PEDESTAL GROUP: TTR, MTR, AND TRR

Section 1. ANTENNA PEDESTAL OR ANTENNA SUPPORT—DATA SIDE

Warning: To avoid injury to personnel or exposure to dangerously high voltages, gain access to the equipment as specified in the procedures.

12. Elevation Position and Correction Transmitter**a. Removal.**

(1) Gain access to the radome as specified in paragraph 11.11.2.

(2) Remove telescope mounting group (R, fig. 4).

(3) Remove side cover (J).

(4) Disconnect P7 (JJ) and P8 (HH) from J1 (H) and J2 (G) for elevation position transmitter (FF) or P6 and P7 from J1 (two J1's exist) for the elevation correction transmitter.

Caution: Exercise care to avoid damaging the exposed gear (C) when removing the transmitter.

(5) Remove the elevation position or correction transmitter.

(6) Remove gear cover (D) from the storage position on the transmitter, and install over the exposed gear.

b. Installation.

(1) Install the position or correction transmitter in the reverse order of removal, as above.

(2) Perform the radar collimation checks in accordance with the track check procedures manual (para 3).

13. Track Antenna Level

Note. The key letters shown in parenthesis below refer to figure 4 unless otherwise indicated.

a. Removal.

(1) Set the ANTENNA switch (fig. 49) to DISABLE. Engage azimuth transit lock (fig. 29).

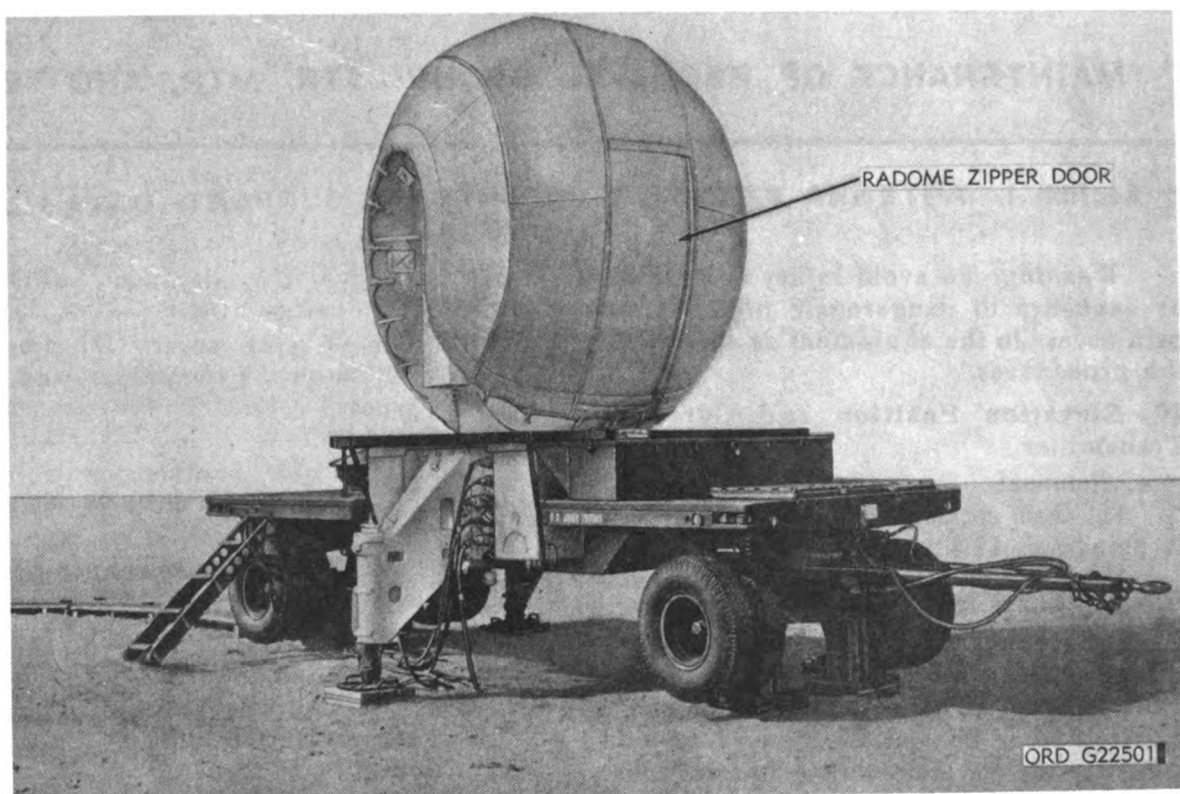


Figure 3. Radome zipper door—location.

- A—CONNECTOR J2
 B—CONNECTOR J3
 C—GEAR
 D—GEAR COVER—8171751
 E—NO. 8 LOCK WASHER—MS35338-23 (2)
 F—NO. 8-32 X 3/8 PAN-HD SCREW—
 MS35225-43 (2)
 G—CONNECTOR J2
 H—CONNECTOR J1
 J—SIDE COVER—8171018
 K—11/32-IN. FLAT WASHER—MS15795-212 (21)
 L—5/16-IN. LOCK WASHER—MS35338-26 (21)
 M—5/16-18 X 1-1/4 HEX-SOCKET-HD SCREW—
 587456 (21)
 N—15/32-IN. FLAT WASHER—MS15795-216 (4)
 P—7/16-IN. LOCK WASHER—MS35338-66 (4)
 Q—7/16-14 X 1-1/2 HEX-HD SCREW—
 MS35303-89 (4)
 R—TELESCOPE MOUNTING GROUP—8015860
 S—OBSERVATION WINDOW
 T—CONNECTOR J1
 U—RIGHT KNOB
 V—RIGHT EYEPiece
 W—TRACK ANTENNA LEVEL—8171987
 X—LEFT EYEPiece
 Y—LEFT KNOB
 Z—5/16-18 X 1-1/2 HEX-SOCKET-HD SCREW—
 MS35457-53 (12)
 AA—5/16-IN. LOCK WASHER—MS35338-26 (12)
 BB—11/32-IN. FLAT WASHER—MS15795-212 (12)
 CC—SWITCH S1 OR S2
 DD—3/8-T6 X 1 HEX-SOCKET-HD SCREW—
 MS35457-66 (6)
 EE—3/8-IN. LOCK WASHER—MS35338-27 (6)
 FF—ELEVATION POSITION TRANSMITTER—
 9007947
 GG—CONNECTOR P21
 HH—CONNECTOR P8
 JJ—CONNECTOR P7
 KK—DOOR

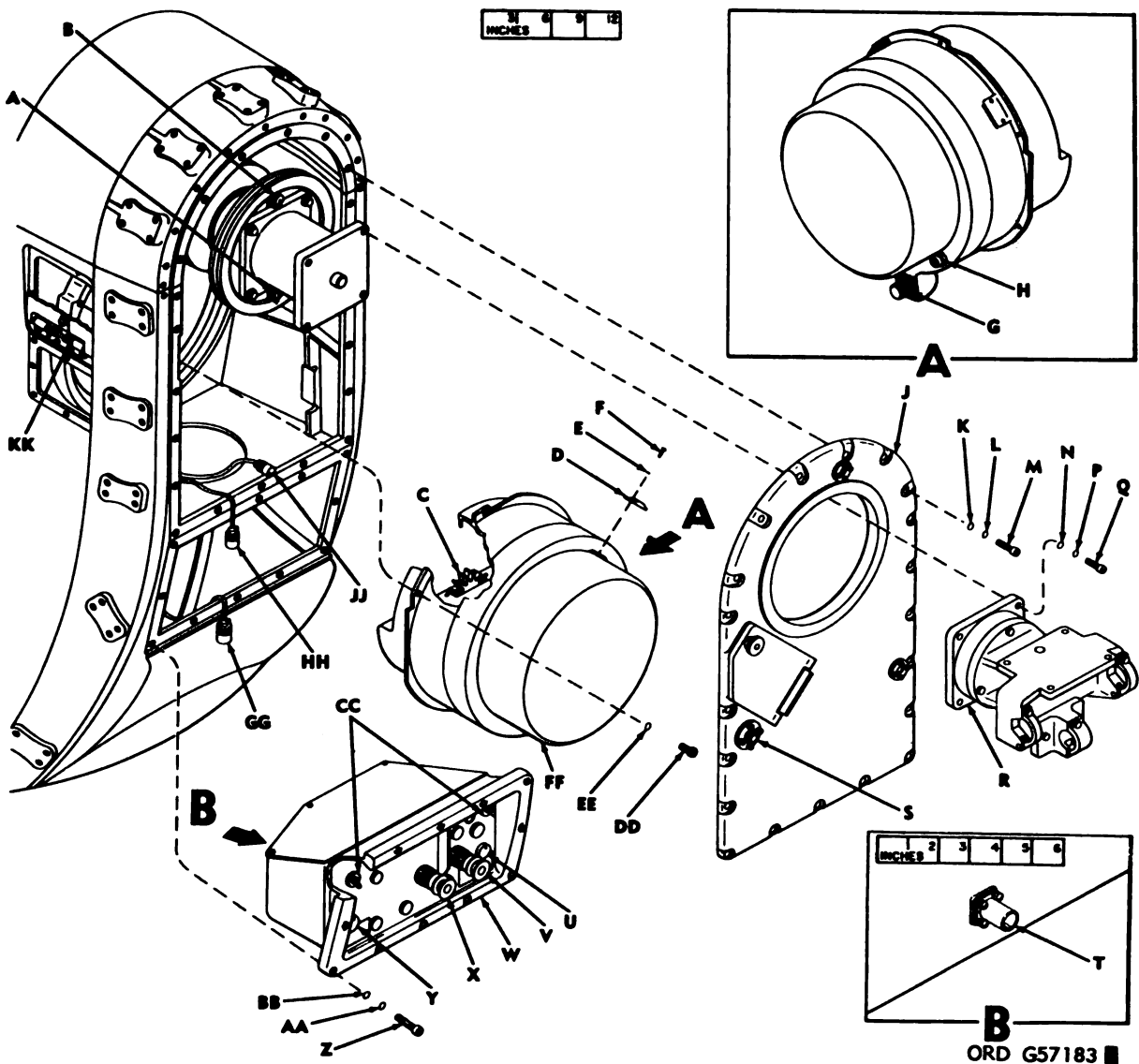


Figure 4. Track antenna pedestal—data side—partially exploded view No. 1.

- (2) Remove 12 hexagon - socket - head screws (Z) and pull track antenna level (W) out of pedestal far enough to reach connector J1 (T).
- (3) Disconnect connector P21 (GG) from connector J1 and remove track antenna level.

b. Installation.

- (1) Slide track antenna level (W) into pedestal far enough to connect connectors P21 (GG) to connector J1 (T).
- (2) Secure level to pedestal.
- (3) Disengage azimuth transit lock (fig. 29). Set antenna disable switch S1 (A, fig. 49) to NORMAL position.

14. Field Maintenance of Track Antenna Level Subassembly 8172014

a. Removal.

- (1) Remove track antenna level (par. 13a).
- (2) Remove cover assembly (D, fig. 5).
- (3) Remove light reflector tube (J, fig. 5).

Note. The key letters shown in parentheses in (4) through (6) below refer to figure 6.

- (4) Remove three flathead screws (H), knob plate (L), and retaining ring (J).

Caution: To prevent knob from becoming disassembled do not remove setscrew.

- (5) Loosen setscrew (M) and remove knob (N) and hexagon nut (K).
- (6) Remove track antenna level subassembly (C) and sleeve bearing (B).

b. Disassembly.

Note. The key letters shown in parentheses in (1) through (3) below refer to figure 7.

- (1) Remove prism assembly (R).
- (2) Remove level (U) and reflector (K).
- (3) Remove spring (B) and associated parts.

Note. The key letters shown in parentheses in (4) through (9) below refer to figure 8.

- (4) Remove spur gear (H), clamp (Y), counter (J), and associated parts.
- (4.1) Remove spring tension clip (AA) and ball (Z) if applicable.
- (5) Remove retaining ring (T) and retaining ring (K).

- (6) Remove spring pin (P) and spring pin (R).
- (7) Hold worm gear (S) and spur gear (Q) in place and pull shaft (W) out of housing sufficiently to reach retaining ring (M) on inside of bearing housing (X). Remove retaining ring.
- (8) Remove worm gear, spur gear, and shaft.
- (9) Remove sleeve spacer (DD), if applicable, and ball bearing (V) from shaft and ball bearing (L) from bearing housing.

Note. The key letters shown in parentheses in (10) through (13) below refer to figure 9.

- (10) Remove spring pin (D) and retaining ring (R).
- (11) Remove four hexagon nuts (G) and setscrews (F).
- (12) Unscrew shaft (Q) from bearing block (L) and remove bearing block, mounting plate (J), ball bearings (M), and ball bearings (K).
- (13) Remove shaft (Q), helical gear (B), flat washer (A), eight limit stops (E), and keyway washer (H).

c. Assembly.

Note 1. Pack all ball bearings to be installed two-thirds full with grease 9150-261-8298.

Note 2. The key letters shown in parentheses in (1) through (12) below refer to figure 9.

- (1) Insert 0.5-inch-od ball bearing (M) into bearing housing (N).
- (2) Insert two 0.375-inch-od ball bearings (K) into bearing block (L).
- (3) Insert two 0.375-inch-od ball bearings (K) into mounting plate (J).
- (4) Place bearing block and mounting plate in relative position on bearing housing.
- (5) Place keyway washer (H) in bearing housing.
- (6) Place one of eight limit stops (E) onto keyway washer with the tab of the limit stop tight against the right side of spring pin (P). Stack the remaining seven limit stops (E) and flat washer (A) as shown (fig. 9).

Note. If installing new helical gear (B), use the pilot hole in the gear as a guide and drill the hole through one side of the gear hub for the 0.078-inch spring pin.

- (7) Place the helical gear on the flat washer in a position so that the tabs of the limit stops are to the right and between spring pin (P) and spring pin (C) in the gear.
- (8) Insert shaft (Q) into bearing housing (N) and the screw shaft into bearing block (L).
- (9) Insert 0.5-inch-od ball bearing (M) and 0.5-inch internal retaining ring (R).
- (10) Aline the hole in gear (B) with the hole in the shaft. If installing a new gear, aline the hole through one side of the gear hub with the hole through the shaft and drill and ream the hole completely through the gear for 0.078 x 1/2 spring pin (D). Install the spring pin.
- (11) Insert two No. 8-32 x 1/2 setscrews (F) into bearing housing (N). Apply 2-inch-ounces maximum torque to the setscrews to secure mounting plate (J) to the bearing housing. Secure the setscrews with two No. 8-32 hexagon nuts (G).

Note. The shaft must rotate freely in the bearing block after the setscrews are installed.

- (12) Insert two No. 8-32 x 1/2 setscrews (F) into the mounting plate. Apply 2-inch-ounces maximum torque to the setscrews to secure bearing block (L) to the mounting plate. Secure the setscrews with two No. 8-32 hexagon nuts (G).

Note. The key letters shown in parentheses in (13) through (19) below refer to figure 8 unless otherwise indicated.

- (13) Insert shaft (W) into one side of bearing housing (X).
- (14) Mesh worm gear (S) with helical gear (B, fig. 9) and insert the shaft through the worm gear. Place 40-tooth spur gear (Q) on the shaft and install 3/16-inch external retaining ring (M) on the shaft.
- (15) Position the shaft in the housing, install 0.5-inch-od ball bearing (L), 3/16-inch external retaining ring (K), 0.625-inch-od ball bearing (V), sleeve spacer (DD), 0.33-inch external retaining

ring (U), and 0.625-inch internal retaining ring (T).

- (16) Aline the pilot hole in worm gear (S) with the hole in the shaft. If installing new gear, drill and ream the hole through the gear for 0.078 x 1/4 spring pin (R). Install the spring pin.
- (17) Aline the pilot hole in spur gear (Q) with the hole in the shaft. Secure the gear to the shaft with No. 4-40 x 3/16 setscrew (N). If installing new gear, drill and ream the hole through the gear for 0.078 x 3/8 spring pin (P). Install the spring pin. Remove the setscrew.
- (17.1) Secure ball (Z) against the end of shaft (W) with spring tension clip (AA) if applicable.
- (18) Install 31/32-inch-long clamp (Y), counter (J), and 15/32-inch-long clamp (F).
- (19) Set the counter to indicate 5000, mesh 32-tooth spur gear (H) with spur gear (Q), and secure the gear with No. 4-40 x 3/16 setscrew (G).

Note. The key letters shown in parentheses in (20) through (22) below refer to figure 7.

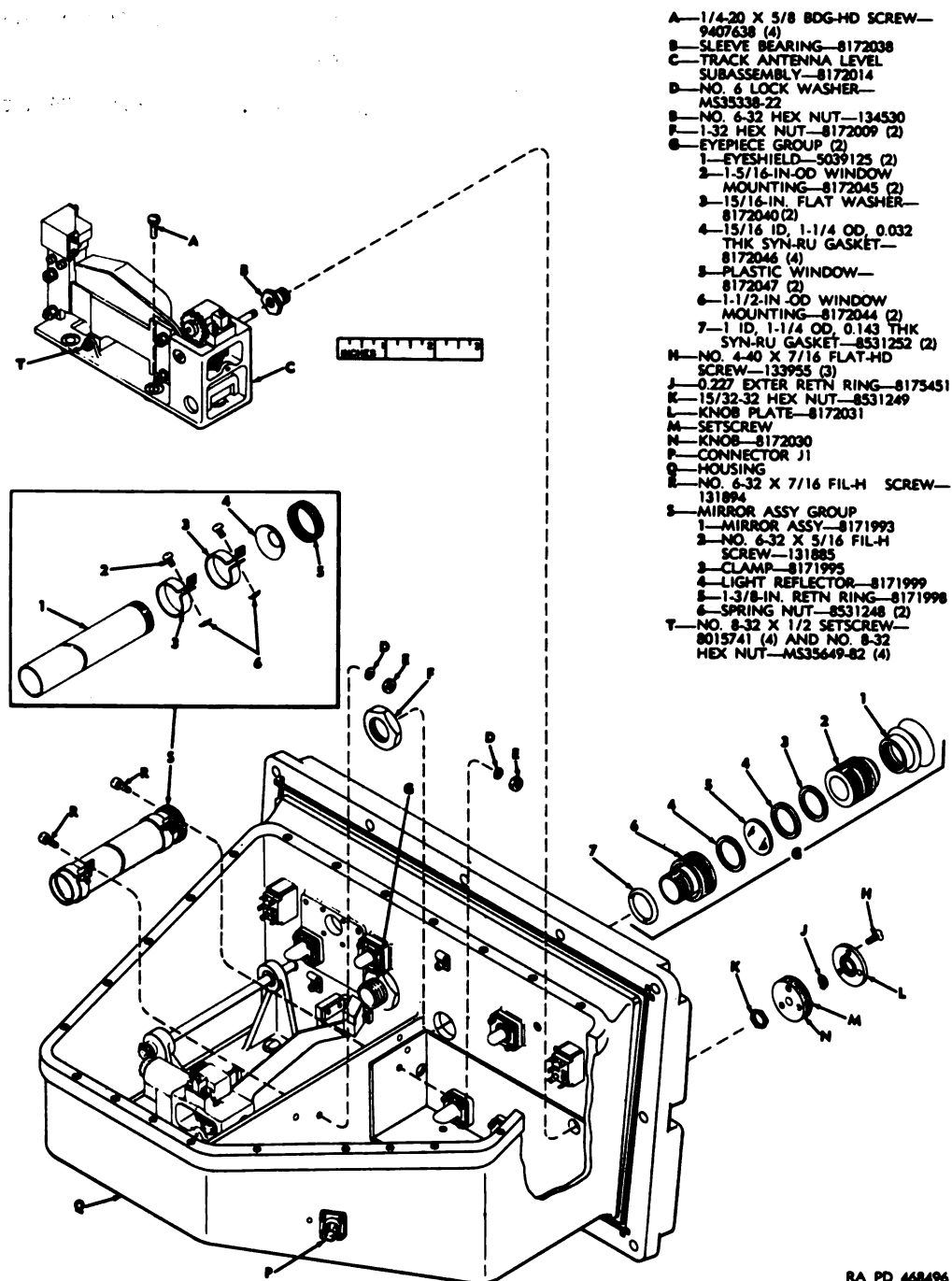
- (20) Install eyebolt (A), bracket (D), and spring (B).
- (21) Install reflector (K).
- (22) Install level (U) and prism assembly (R).

d. Installation.

Note. The key letters shown in parentheses below refer to figure 6 unless otherwise indicated.

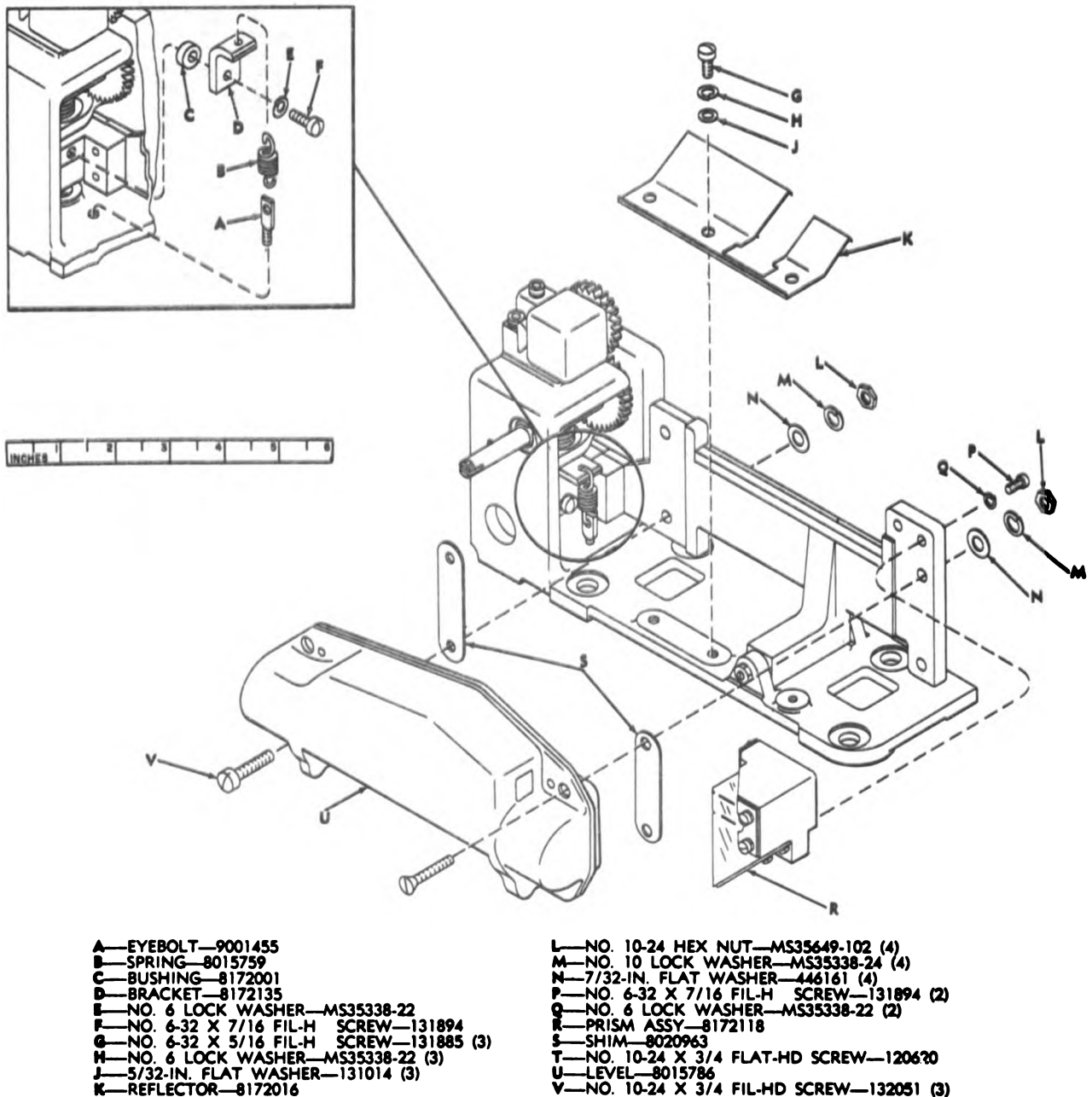
- (1) Place sleeve bearing (B) on the shaft of track antenna level subassembly (C).
- (2) Apply sealer 8030-00-507-3154 to the threads of four 1/4-20 x 5/8 binding-head screws (A) and secure the subassembly to housing (Q).
- (3) Apply varnish 5770-00-061-1974 to the threads of 15/32-32 hexagon nut (K) and secure the sleeve bearing to the housing.
- (4) Place knob (N) on the shaft and secure with 0.227 external retaining ring (J) and setscrew (M).

- | (5) Apply sealer 8030-00-507-3154 to the threads of three No. 4-40x7/16 flathead screws (H) and secure knob plate (L) to the knob.
- (6) Install light reflector tube (J, fig. 5).
- (7) Install cover assembly (D, fig. 5).



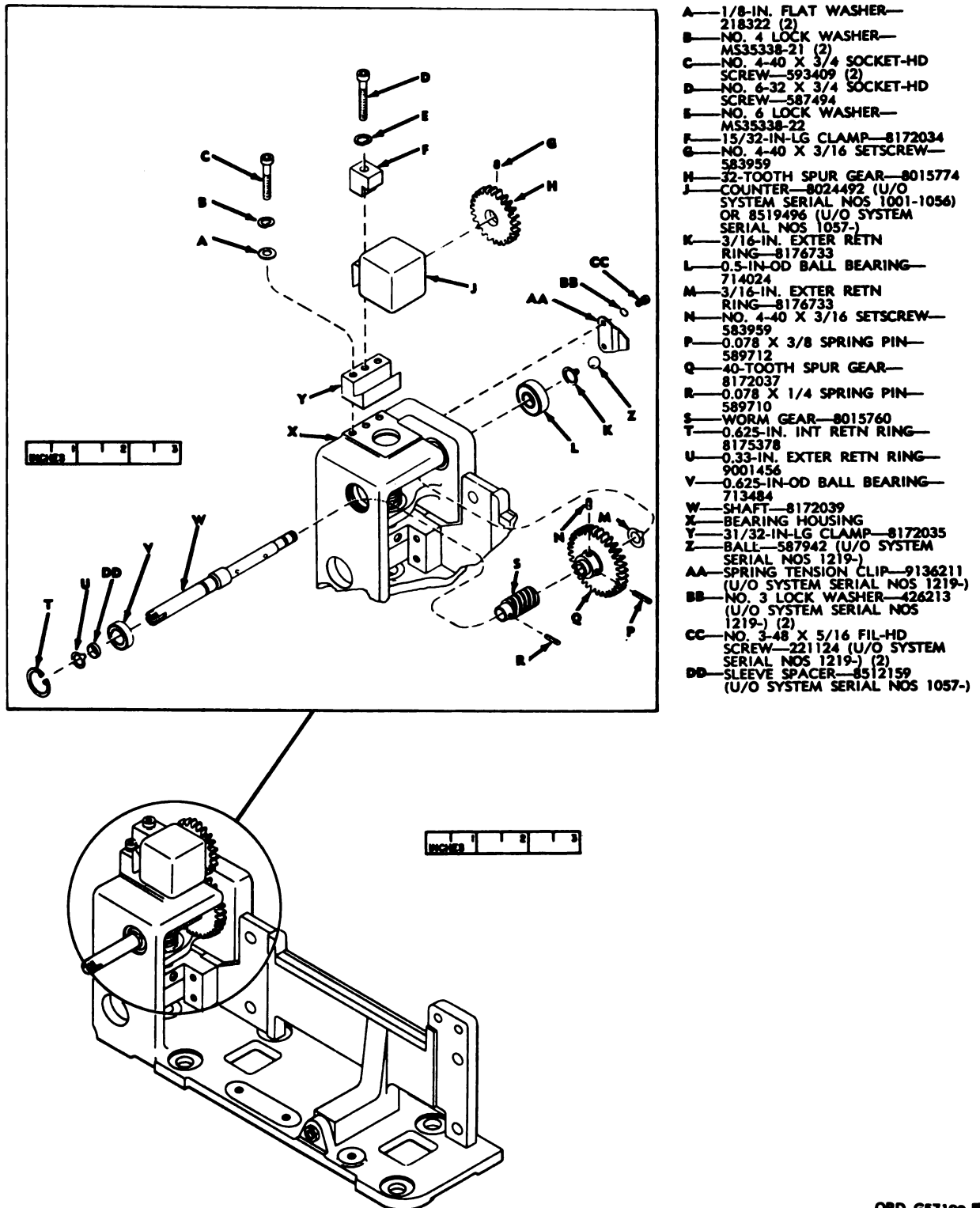
RA PD 468496

Figure 6. Track antenna level—partially exploded view No. 2.

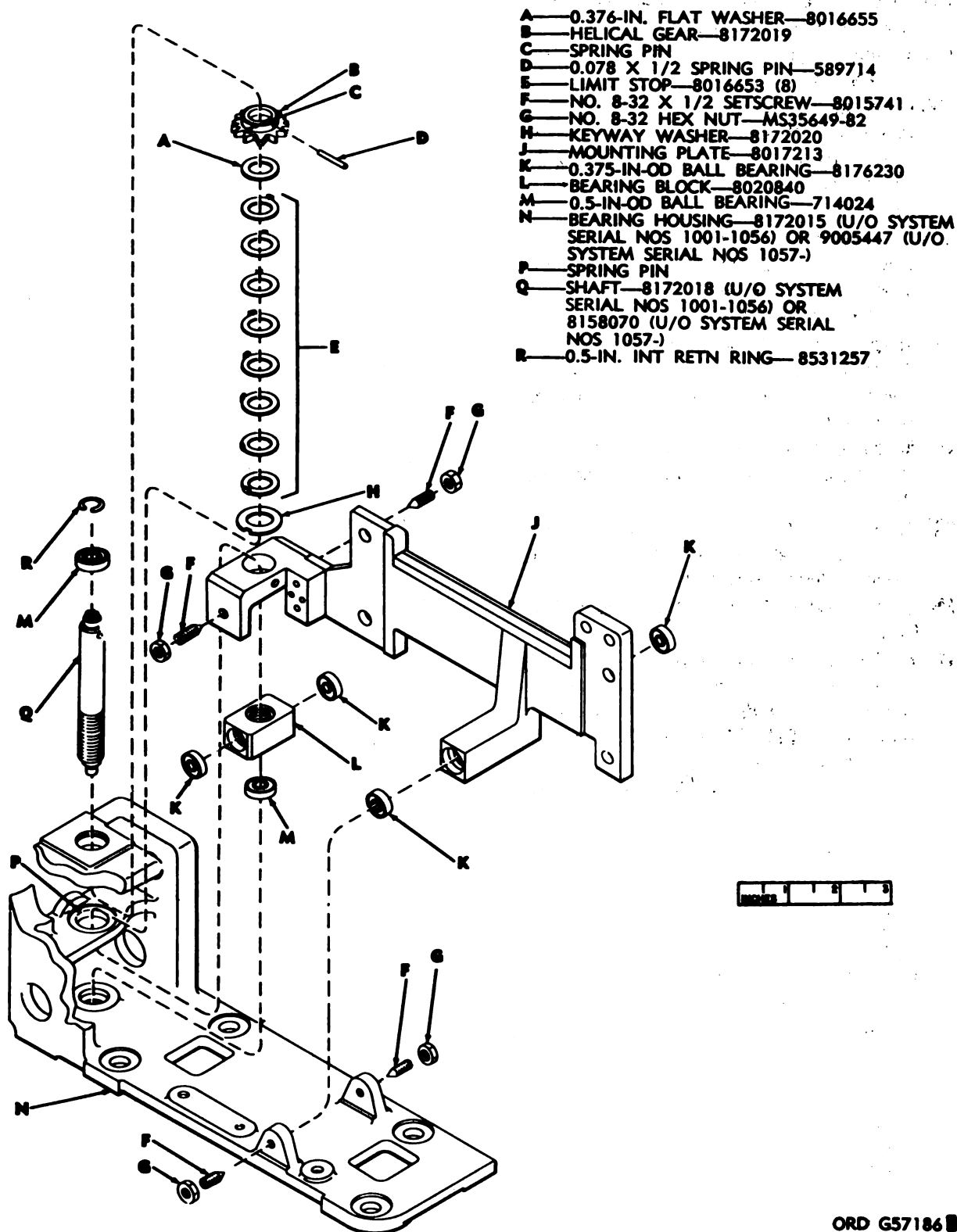


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Figure 7. Track antenna level subassembly 8178014—partially exploded view No. 1.



ORD G57190



ORD G57186

Figure 9. Truck antenna level subassembly 8172014—partially exploded view No. 2.

e. Mechanical Requirements.

- (1) Attach the track antenna level to a horizontally level stable surface.
- (2) Connect connector J1 (P, fig. 6) to a 6.3-volt, 400-cps power source.
- (3) Press light switch S1 or S2 (CC, fig. 4) and turn left knob (Y, fig. 4) until the split image of the bubble is alined (B, fig. 10) as viewed through left eyepiece (X, fig. 4).
- (4) Misalign the split image of bubble (A, fig. 10) by rotating the knob approximately two revolutions in a clockwise direction.
- (5) Rotate the knob in a counterclockwise direction until the split image of the bubble is alined. Record the counter indication.
- (6) Rotate the knob two additional revolutions in a counterclockwise direction.
- (7) Carefully rotate the knob clockwise until the split image of the bubble is alined. Record the counter indication.
- (8) Repeat steps (3) through (7) above three times.
- (9) If the average indications of (5) and (7) above, of the four trials, do not differ by more than one division of the counter, align the split image of the bubble, remove gear (H, fig. 8), adjust the counter to indicate 5000, and install the gear.

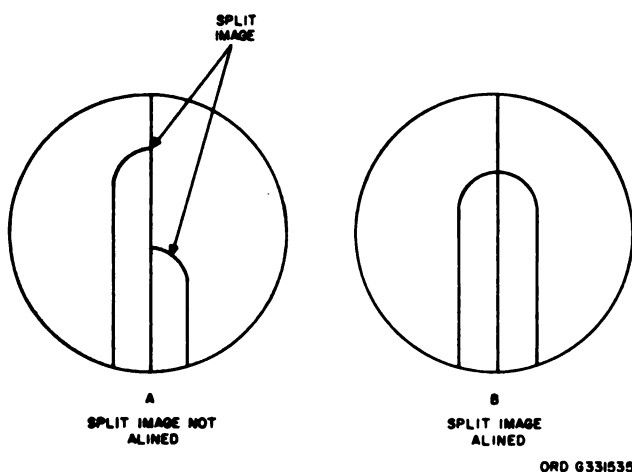


Figure 10. Alinement of split image bubble.

- (10) If the average indications of (5) and (7) above, of the four trials, differ by more than one division of the counter, the backlash of the gear system and/or of the level setscrew (T, fig. 6) is excessive and mechanical adjustments in *f* below must be performed.

f. Mechanical Adjustments.

- (1) To adjust for backlash, remove cover assembly (D, fig. 5).
- (2) Check spur gear (H, fig. 8) and mating gear for free rotation without binding. The backlash should be 0.005 to 0.010 inch for free gear rotation. If there is no backlash between the spur gear and mating gear, and the gears seem to bind, remove counter (J, fig. 8). Cut shims from the shim stock and add shims under 31/32-inch-long clamp (Y, fig. 8) to raise the gear as required for free rotation.
- (3) No backlash adjustment can be made between helical gear (B, fig. 9) and its driving worm gear (S, fig. 8).
- (4) If further adjustment is necessary, loosen hexagon nut (T, fig. 6), remove setscrew, and examine for burrs, dents, or scratches on the polished cone surface. If the surface is smooth, insert setscrew and turn lightly using 2-inch-ounces maximum torque. Hold the setscrew from further tightening and lock in place with the hexagon nut. If the setscrew cone surface is deformed, it should be reground or replaced. Check the level by hand, moving up and down, to determine if the setscrews have contacted the ball bearings.
- (5) If excessive backlash is still present, remove the track antenna level subassembly (*a* above) and examine the remaining three setscrews. Install new setscrews if required.

15. Maintenance of Track Antenna Level Subassembly 8172012**a. Removal.**

- (1) Remove the track antenna level (para 13a).

- (2) Remove cover assembly (D, fig. 5).
- (3) Remove brass tube (T, fig. 5).
- (4) Remove housing assembly (Y, fig. 5).
- (5) Remove mirror assembly group (S, fig. 6).

Note. The key letters shown in parentheses in (6) through (8) below refer to figure 11.

- (6) Remove three flathead screws (K), knob plate (H), and retaining ring (G).

Caution: To prevent the knob from becoming disassembled, do not remove the setscrew.

- (7) Loosen setscrew (F) and remove knob (E) and hexagon nut (D).
- (8) Remove track antenna level subassembly (W) and sleeve bearing (A).

b. Disassembly.

Note. The key letters shown in parentheses in (1) through (5) below refer to figure 12 unless otherwise indicated.

- (1) Remove level (S).
- (2) Remove reflector (K).
- (3) Remove spring (B) and associated parts.
- (4) Remove prism assembly (K, fig. 13).
- (5) Remove bevel gear (B, fig. 13), ball bearings (E, fig. 13), shaft (H, fig. 13), and associated parts.

Note. The key letters shown in parentheses in (6) through (10) below refer to figure 14.

- (6) Remove spur gear (F), counter (G), clamp (H), and associated parts.
- (6.1) Remove spring tension clip (CC) and ball (BB) if applicable.
- (7) Remove bevel gear (K), retaining ring (M), and retaining ring (X).
- (8) Remove spring pin (S) and spring pin (U).
- (9) Partially remove shaft (P) and remove retaining ring (V), worm gear (T), and spur gear (R). Remove shaft.
- (10) Remove ball bearing (N) from shaft (P) and ball bearing (W) from bearing housing (Y).

Note. The key letters shown in parentheses in (11) through (14) below refer to figure 15.

- (11) Remove spring pin (D) and retaining ring (R).

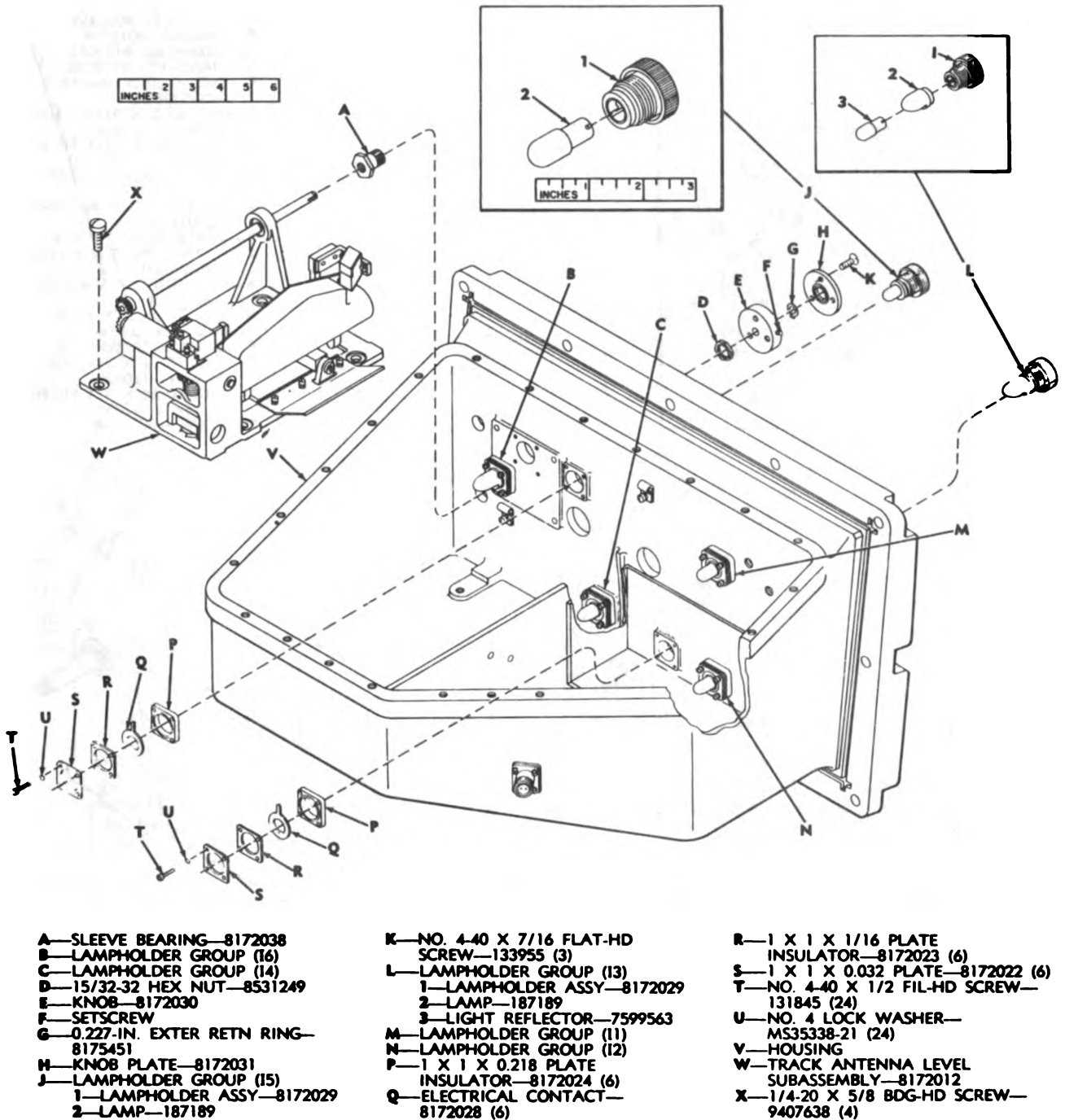
- (12) Remove four hexagon nuts (G) and setscrews (F).
- (13) Unscrew shaft (Q) from bearing block (L) and remove bearing block, mounting plate (J), ball bearings (K), and ball bearings (M).
- (14) Remove shaft (Q), helical gear (C), flat washer (A), eight limit stops (E), and keyway washer (H).

c. Assembly.

Note. The key letters shown in parentheses in (1) through (12) below refer to figure 15.

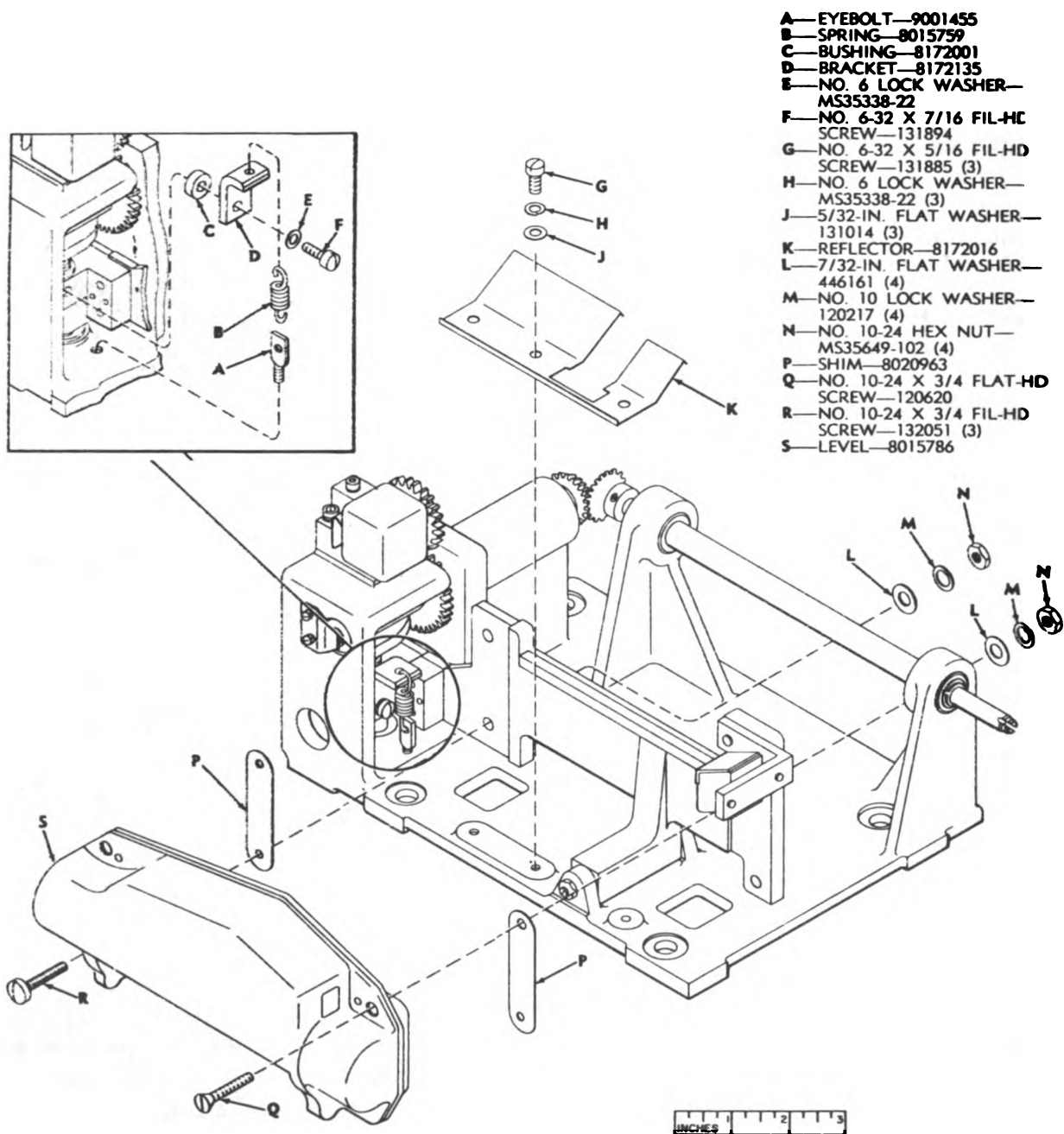
Note. Pack all ball bearings to be installed two-thirds full with grease 9150-00-753-4588.

- (1) Insert 0.5-inch-od ball bearing (M) into bearing housing (N).
- (2) Insert two 0.375-inch-od ball bearings (K) into bearing block (L).
- (3) Insert two 0.375-inch-od ball bearings (K) into mounting plate (J).
- (4) Place the bearing block and mounting plate in relative position on the bearing housing.
- (5) Place keyway washer (H) in the bearing housing.
- (6) Place one of eight limit stops (E) on the keyway washer with the tab of the limit stop tight against the right side of spring pin (P). Stack the remaining seven limit stops (E) and flat washer (A) as shown.
- Note.* If installing new helical gear (C), use the pilot hole in the gear as a guide and drill hole through one side of the gear hub for the 0.078-inch spring pin.
- (7) Place the helical gear on the flat washer in a position so that the tabs of the limit stops are to the right and between spring pin (P) and spring pin (B) in the gear.
- (8) Insert shaft (Q) into bearing housing (N) and the screw shaft into bearing block (L).
- (9) Insert 0.5-inch-od ball bearing (M) and 0.5-inch internal retaining ring (R).
- (10) Aline the pilot hole in gear (C) with the hole in the shaft. If installing new gear, aline the hole through one side of the gear hub with the hole



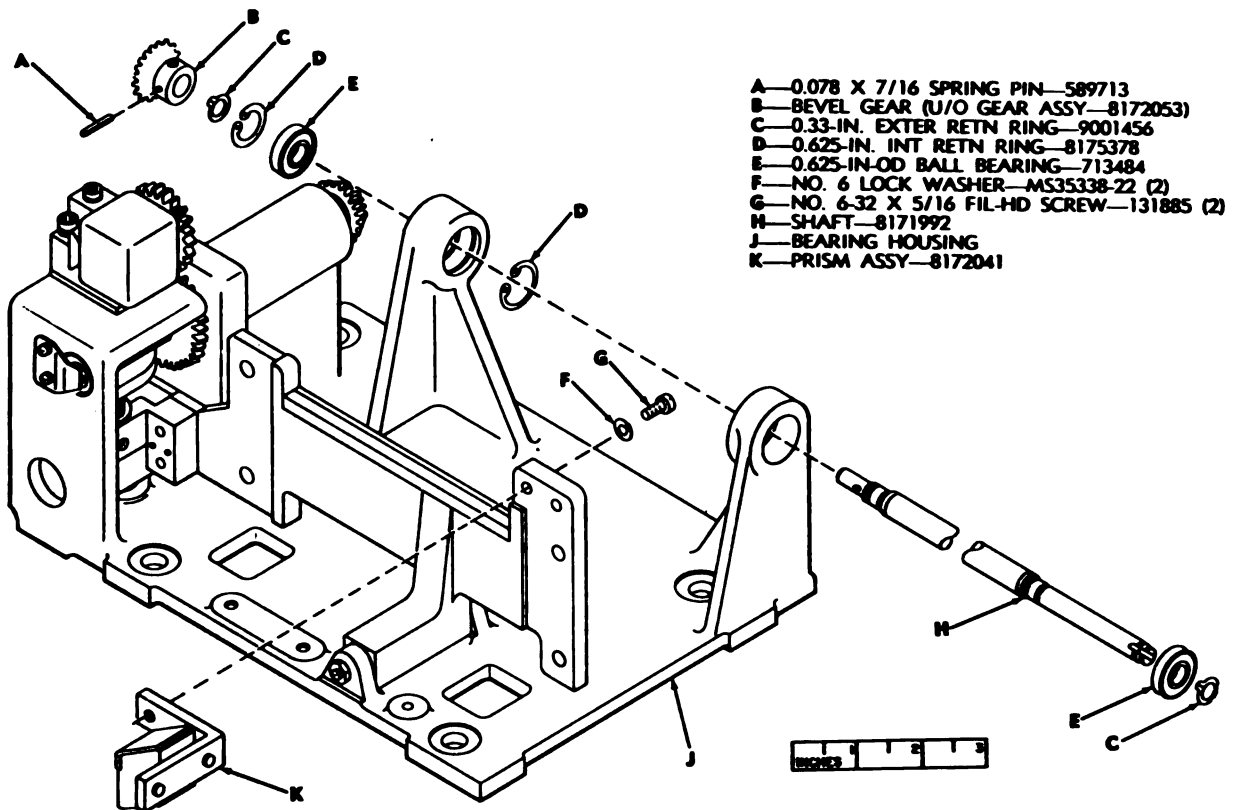
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Figure 11. Track antenna level - partially exploded view No. 3.



ORD G16030

Figure 12. Track antenna level subassembly 8172012 - partially exploded view No. 1.



ORD G16031

Figure 18. Track antenna level subassembly 8172012—partially exploded view No. 2.

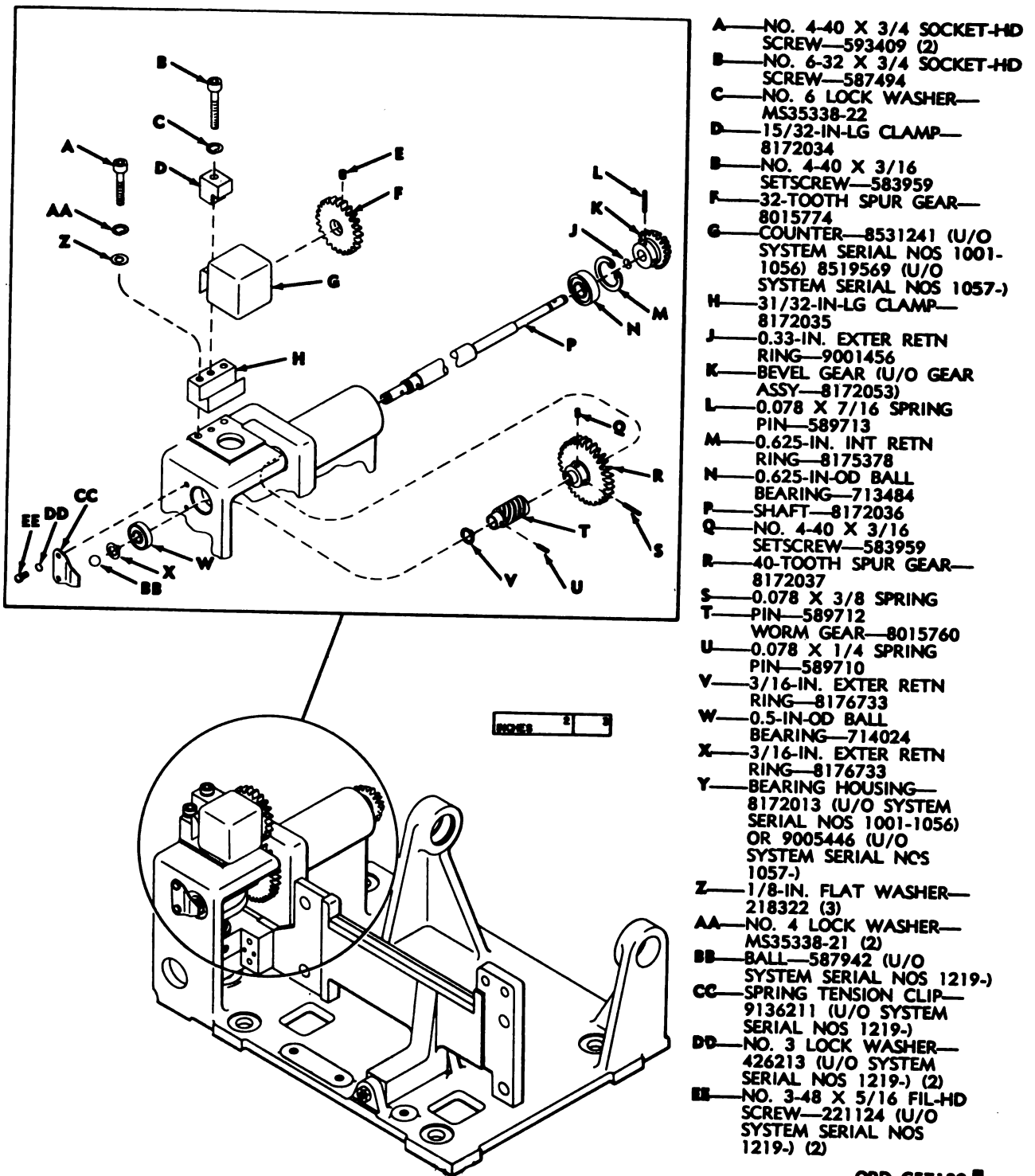
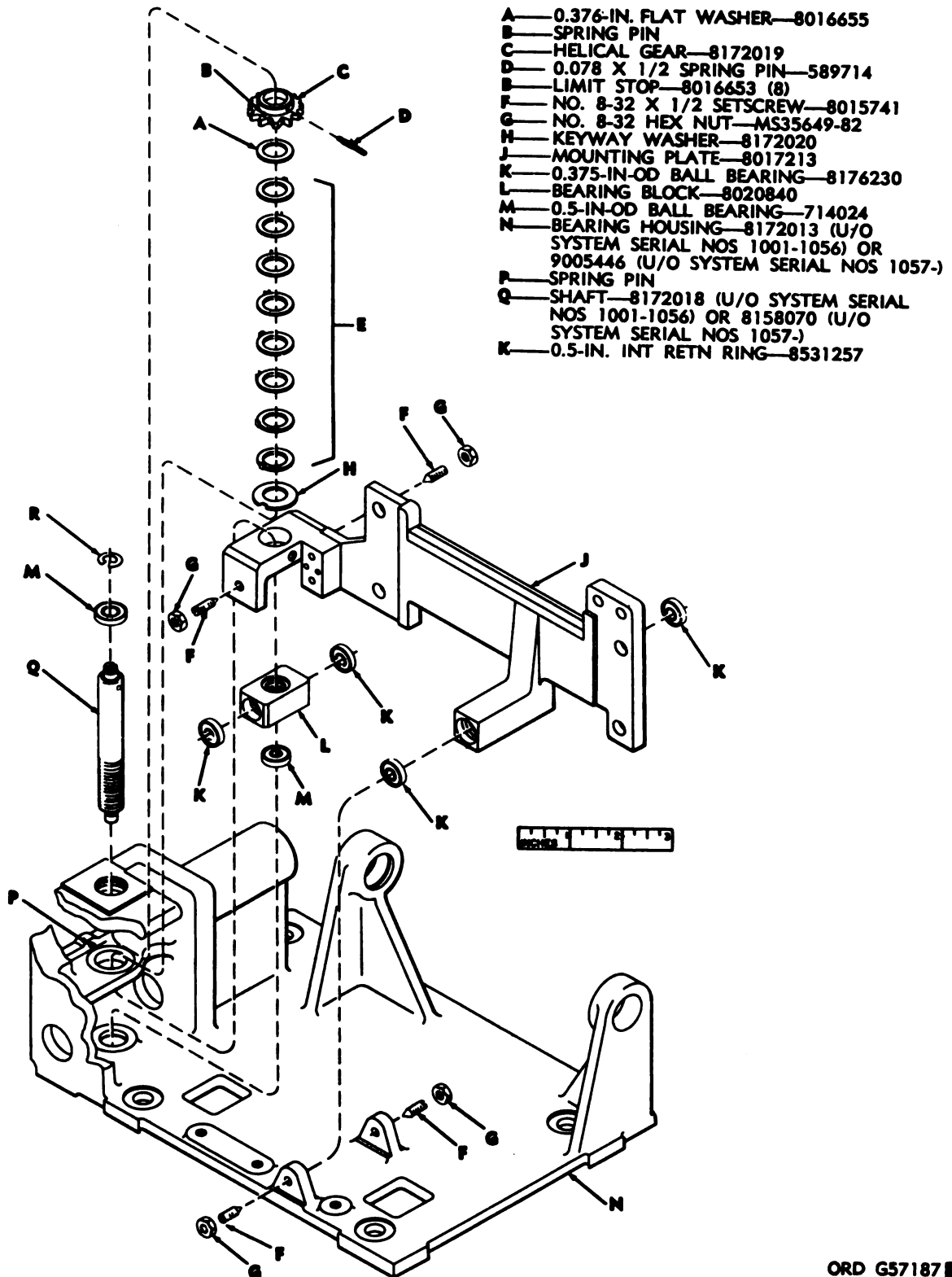


Figure 14. Track antenna level subassembly 8172012—partially exploded view No. 8.



ORD G57187

Figure 15. Track antenna level subassembly 8172019—partially exploded view No. 4.

through shaft and drill and ream hole completely through gear for 0.078 x 1/2 spring pin (D). Install spring pin.

- (11) Insert two No. 8-32 x 1/2 setscrews (F) into bearing housing (N). Using 2-inch-ounces maximum torque, secure mounting plate (J) to bearing housing. Secure setscrews with two No. 8-32 hexagon nuts (G).

Note. Shaft must rotate freely in bearing block after setscrews are installed.

- (12) Insert two No. 8-32 x 1/2 setscrews (F) into mounting plate. Using 2-inch-ounces maximum torque, secure bearing block (L) to mounting plate. Secure setscrews with two No. 8-32 hexagon nuts (G).

Note. The key letters shown in parentheses in (13) through (20) below refer to figure 14 unless otherwise indicated.

- (13) Insert shaft (P) through one side of bearing housing (Y).
- (14) Place 40-tooth spur gear (R) on shaft. Mesh worm gear (T) with helical gear (C, fig. 15) and insert shaft through worm gear. Install 3/16-inch external retaining ring (V) on shaft.
- (15) Position shaft in housing, install 0.625-inch-od ball bearing (N), 0.625-inch internal retaining ring (M), 0.33-inch external retaining ring (J), 0.5-inch-od ball bearing (W), and 3/16-inch external retaining ring (X).
- (16) Aline pilot hole in spur gear (R) with hole in shaft. Secure gear to shaft with No. 4-40 x 3/16 setscrew (Q). If installing new gear, drill and ream hole through gear for 0.078 x 3/8 spring pin (S). Install spring pin. Remove setscrew.
- (17) Aline pilot hole in worm gear (T) with hole in shaft. If installing new

gear, drill and ream hole through gear for 0.078 x 1/4 spring pin (U). Install spring pin.

Note. Bevel gear (K) and bevel gear (B, fig. 13) comprise a matched pair. If either gear is to be replaced, replace both gears with gear assembly 8172053.

- (18) Place bevel gear (K) on shaft. Aline holes in gear with hole in shaft and secure gear with 0.078 x 7/16 spring pin (L).
- (18.1) Secure ball (BB) against end of shaft (P) with spring tension clip (CC) if applicable.
- (19) Install 31/32-inch-long clamp (H), counter (G), and 15/32-inch-long clamp (D).
- (20) Set counter to indicate 5,000, mesh 32-tooth spur gear (F) with spur gear (R), and secure gear with No. 4-40 x 3/16 setscrew (E).

Note. The key letters shown in parentheses in (21) through (26) below refer to figure 13 unless otherwise indicated.

- (21) Insert shaft (H) into bearing housing (J) and place 0.625-inch internal retaining ring (D) on shaft.
- (22) Insert two 0.625-inch-od ball bearings (E). Place bevel gear (B) on shaft and secure shaft with retaining rings (D) and two 0.33-inch external retaining rings (C).
- (23) Mesh gear with bevel gear (K, fig. 14) and secure gear with 0.078 x 7/16 spring pin (A).
- (24) Install prism assembly (K).
- (25) Install eyebolt (A, fig. 12), bracket (D, fig. 12), and spring (B, fig. 12).
- (26) Install reflector (K, fig. 12) and level (S, fig. 12).

d. Installation.

Note. The key letters shown in parentheses below refer to figure 11 unless otherwise indicated.

- (1) Place sleeve bearing (A) on shaft of track antenna level subassembly (W).
- (2) Apply sealer 8030-507-3154 to

- threads of four $1/4$ -20 x $5/8$ binding-head screws (X) and secure subassembly to housing (V).
- (3) Apply varnish 7612884 to threads of $15/32$ -32 hexagon nut (D) and secure sleeve bearing to housing.

- (4) Place knob (E) on shaft and secure with 0.227 external retaining ring (G) and setscrew (F).
- (5) Apply sealer 8030-507-3154 to threads of three No. 4-40 x $\frac{1}{8}$ flathead screws (K) and secure knob plate (H) to knob.
- (6) Install housing assembly (Y, fig. 5).
- (7) Install mirror assembly group (S, fig. 6).
- (8) Install brass tube (T, fig. 5).
- (9) Install cover assembly (D, fig. 5).
- (10) Mechanical requirements and adjustments for track antenna level sub-assembly 8172012 are identical to the procedure in (para 14e and f).
- (11) Install track antenna level (para 13b).

16. Maintenance of Miscellaneous Components of Track Antenna Level

a. Removal and Installation of Eyepiece Group.

- (1) Remove track antenna level (para 13a).
- (2) Remove cover assembly (D, fig. 5).
- (3) Remove and disassemble eyepiece group (G, fig. 6).
- (4) Assemble eyepiece group. Cement new gasket (G7, fig. 6) in place on window mounting (G6, fig. 6) with rubber adhesive 8024365. Install eyepiece group.
- (5) Install cover assembly (D, fig. 5).
- (6) Install track antenna level (para 13b).

b. Removal and Installation of Housing Assembly 8172007.

- (1) Remove track antenna level (para 13a).
Note. The key letters shown in parentheses in (2) through (8) below refer to figure 5.
- (2) Remove cover assembly (D).
- (3) Remove housing assembly (Y), metal window (Q), observation window (L), and gasket (K).
- (4) Disassemble housing assembly.
- (5) Apply sealer 8030-507-3154 to threads of two No. 4-40 x $\frac{1}{8}$ binding-head screws (M) and secure new gasket (K), observation window (L), and metal window (Q).
- (6) Cement cellular rubber strips (AA) to mirror (BB) with rubber adhesive

8024365 and assemble housing assembly.

- (7) Install housing assembly (Y).
- (8) Install cover assembly (D).
- (9) Install track antenna level (para 13b).

c. Removal and Installation of Mirror Assembly Group.

- (1) Remove track antenna level (para 13a).
- (2) Remove cover assembly (D, fig. 5).
- (3) Remove brass tube (T, fig. 5).
- (4) Remove and disassemble mirror assembly group (S, fig. 6).
- (5) Assemble mirror assembly group. Tighten two clamps (S3, fig. 6) until light pressure is required to move clamps on mirror assembly (S1, fig. 6).
- (6) Install mirror assembly group.
- (7) Connect connector J1 (P, fig. 6) to a 6.3-volt, 400-cps power source.
- (8) Position mirror assembly so that one-half of lamp I4 of lampholder group (C, fig. 11) is within mirror assembly. Depress switch S1 or S2 (CC, fig. 4) to light lamp and rotate mirror assembly clockwise or counterclockwise until level viewed through right eyepiece (V, fig. 4) is well lighted. Tighten clamps (S3, fig. 6).
- (9) Install cover assembly (D, fig. 5).
- (10) Install track antenna level (para 13b).

d. Removal and Installation of Lampholder Group I5.

- (1) Remove track antenna level (para 13a).
- (2) Remove cover assembly (D, fig. 5).
- (3) Remove brass tube (T, fig. 5).
- (4) Disconnect lead from electrical contact (Q, fig. 11).
- (5) Remove lampholder group (J, fig. 11) and associated parts.
- (6) Install lampholder group and associated parts.
Note. Tab of electrical contact (Q, fig. 11) may be bent slightly to insure electrical contact.
- (7) Connect lead to electrical contact.
- (8) Install brass tube (T, fig. 5).
- (9) Install cover assembly (D, fig. 5).
- (10) Install track antenna level (para 13b).

e. Removal and Installation of Lampholder Group I3.

- (1) Remove track antenna level (para 13a).
 - (2) Remove track antenna level subassembly (para 14a).
 - (3) Disconnect lead from electrical contact (Q, fig. 11).
 - (4) Remove lampholder group (L, fig. 11) and associated parts.
 - (5) Install lampholder group and associated parts.
- Note.* Tab of electrical contact (Q, fig. 11) may be bent slightly to insure electrical contact.
- (6) Connect lead to electrical contact.
 - (7) Install track antenna level subassembly (para 14d).
 - (8) Install track antenna level (para 13b).

f. Removal and Installation of Lampholder Group I2.

- (1) Remove track antenna level (para 13a).
- (2) Remove track antenna level subassembly (para 14a).
- (3) To remove and install lampholder group (N, fig. 11) follow the procedure in (para 16d (4) through (7)).
- (4) Install track antenna level subassembly (para 14d).
- (5) Install track antenna level (para 13b).

g. Removal and Installation of Lampholder Group I4.

- (1) Remove track antenna level (para 13a).
- (2) Remove cover assembly (D, fig. 5).
- (3) Remove brass tube (T, fig. 5).
- (4) Remove mirror assembly group (S, fig. 6).
- (5) To remove and install lampholder group (C, fig. 11), follow the procedure in d (4) through (7) above.
- (6) Install mirror assembly group (S, fig. 6).
- (7) Install brass tube (T, fig. 5).
- (8) Install cover assembly (D, fig. 5).
- (9) Install track antenna level (para 13b).

h. Removal and Installation of Lampholder Group I1.

- (1) Remove track antenna level (para 13a).
- (2) Remove cover assembly (D, fig. 5).
- (3) Remove light reflector tube (J, fig. 5).

- (4) To remove and install lampholder group (M, fig. 11), follow the procedure in d (4) through (7) above.

- (5) Install light reflector tube (J, fig. 5).
- (6) Install cover assembly (D, fig. 5).
- (7) Install track antenna level (para 13b).

i. Removal and Installation of Lampholder Group I6.

- (1) Remove track antenna level (para 13a).
- (2) Remove cover assembly (D, fig. 5).
- (3) Remove housing assembly (Y, fig. 5).
- (4) To remove and install lampholder group (B, fig. 11), follow the procedure in (para 16e (3) through (6)).
- (5) Install housing assembly (Y, fig. 5).
- (6) Install cover assembly (D, fig. 5).
- (7) Install track antenna level (para 13b).

17. Removal and Installation of Mirror Assembly 8171768

a. Removal.

- (1) Set antenna disable switch S1 (A, fig. 49) to ANTENNA DISABLE position. Engage azimuth transit lock (fig. 29).
- (2) Open radome zipper door (fig. 3) and engage elevation lock (fig. 29).
- (3) Remove cover assembly (BB, fig. 16).
- (4) Remove mirror assembly (AA, fig. 16).

b. Installation.

- (1) Install mirror assembly (AA, fig. 16).
- (2) Install cover assembly (BB, fig. 16).
- (3) Disengage elevation lock (fig. 29).
- (4) Close radome zipper door (fig. 3).
- (5) Disengage azimuth transit lock (fig. 29). Set antenna disable switch S1 (A, fig. 49) to NORMAL position.

18. Removal and Installation of Gear Assembly 8172141 and Elevation Transmitter Synchro 8212801

Warning: All maintenance on gear assembly and elevation transmitter synchro shall be performed with the TARGET POWER switch or the MISSILE POWER switch, as applicable, on the radar power control panel in the off position.

a. Removal.

(1) Gain access to the radome (para 11.11.2).

(2) Open door (KK, fig. 4).

(3) Remove cover (G, fig. 16).

(4) Disconnect and tag the leads from elevation transmitter synchro (DD).

(5) Remove the synchro.

(6) Remove gear assembly (D) from the shaft of the synchro.

b. Installation.

(1) Apply grease MIL G 23827 sparingly to the teeth of gear assembly (D).

(2) Place the gear assembly on the shaft of elevation transmitter synchro (DD), and secure with washer (B) and hexagon nut (A). Install the synchro.

(3) Return the equipment to normal operation in the reverse order of removal, a (4) through (1) above.

(4) Perform the radar collimation checks in accordance with the track check procedures manual (para 3).

19. Spur Gear (15-Tooth)

Warning: To avoid injury to personnel or exposure to dangerously high voltages, gain access to the equipment as specified in the procedures.

a. Removal.

(1) Gain access to the radome as specified in paragraph 11.11.2.

(2) Remove telescope mounting group (R, fig. 4).

(3) Remove side cover (J).

(4) Remove gear (W, fig. 16).

b. Installation.

(1) Apply grease MIL G 23827 to the teeth of 15-tooth spur gear.

(2) Apply sealer 8175965 to the threads of two no. 10-32 X 3/16 hexagon socket-head setscrews (T, fig. 16), and install the gear.

(3) Return the equipment to normal operation in the reverse order of removal, a (3) through (1) above.

20. Sensitive Switch S8

Warning: To avoid injury to personnel or exposure to dangerously high voltages, gain access to the equipment as specified in the procedures.

a. Removal.

(1) Gain access to the radome as specified in paragraph 11.11.2.

(2) Remove telescope mounting group (R, fig. 4).

(3) Remove side cover (J).

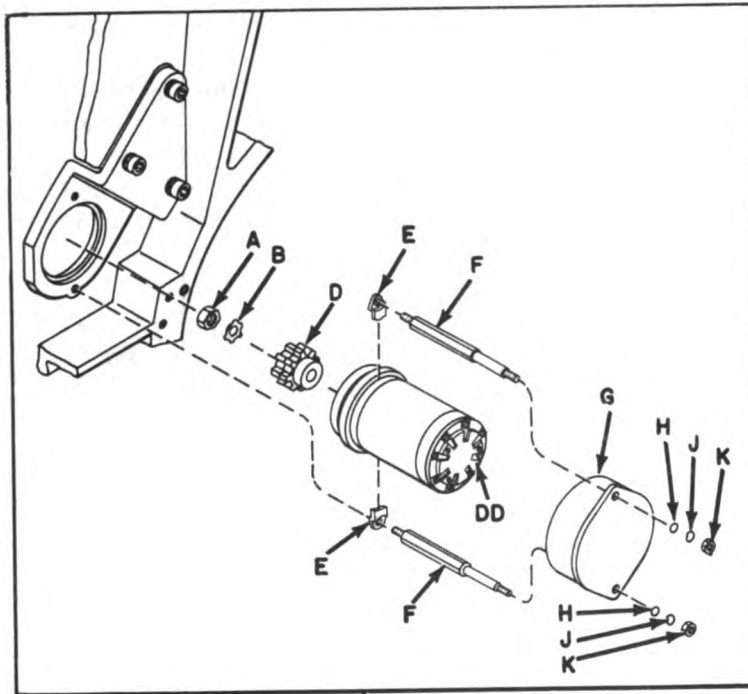
(4) Disconnect and tag the leads from switch (M, fig. 16).

(5) Remove the switch.

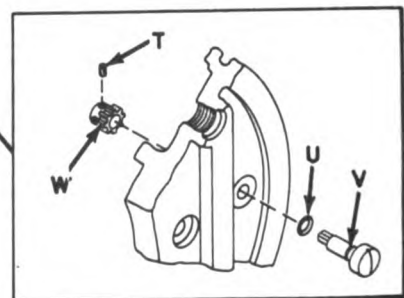
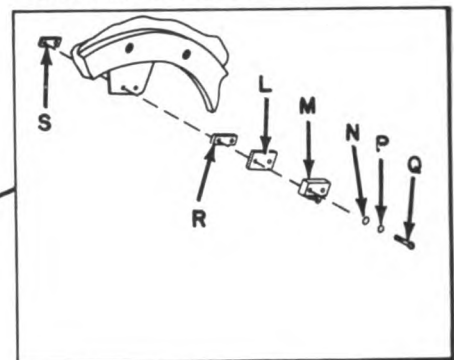
b. Installation.

(1) Install the switch in the reverse order of removal, a above.

(2) Perform the guidance cutoff (GCO) switch checks in accordance with the computer check procedures manual (para 3).



- A—Hex nut (furn / w transmitter synchro)
- B—Washer (furn / w transmitter synchro)
- C—(Deleted)
- D—Gear assy
- E—Clamp
- F—Stud
- G—Cover
- H—0.156-in. flat washer
- J—No. 6 lockwasher
- K—No. 6-32 hex nut
- L—Insulator
- M—Sensitive switch (S8)
- N—0.156-in. flat washer
- P—No. 6 lockwasher
- Q—No. 6-32 X 1 1/4 pan-hd screw (2)
- R—Spacer
- S—Plate
- T—No. 10-32 X 3 / 16 hex-socket-hd setscrew (2)
- U—Preformed packing
- V—0.373 X 1 3/8 headed straight pin
- W—15-tooth spur gear
- X—No. 10-24 X 3/8 pan-hd screw (2)
- Y—No. 10 lockwasher (2)
- Z—0.25-in. flat washer (2)
- AA—Mirror assy
- BB—Cover assy
- CC—No. 10-24 X 3/8 flat hd screw
- DD—(Elevation) transmitter synchro



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Figure 16. Track antenna pedestal—data side—partially exploded view no. 2.

21. Helical Torsion Springs

Note. The following procedure also applies to three helical torsion springs located in similar positions on the data side.

a. Removal.

(1) Set the ANTENNA switch (fig. 49) to **DISABLE**, and engage azimuth transit lock (fig. 29).

Note. Step (2) below applies only to helical torsion spring (P, fig. 17).

(2) Remove flap fastener (U).

(3) Remove headless straight pin (Q or K) and spring (P or L).

b. Installation.

Install the helical torsion spring in the reverse order of removal, a above.

22. (Deleted)

23. Roller Guide

Warning: To avoid injury to personnel or exposure to dangerously high voltages, gain access to the equipment as specified in the procedures.

a. Removal.

(1) Gain access to the radome as specified in paragraph 11.11.2.

(2) Remove telescope mounting group (R, fig. 4).

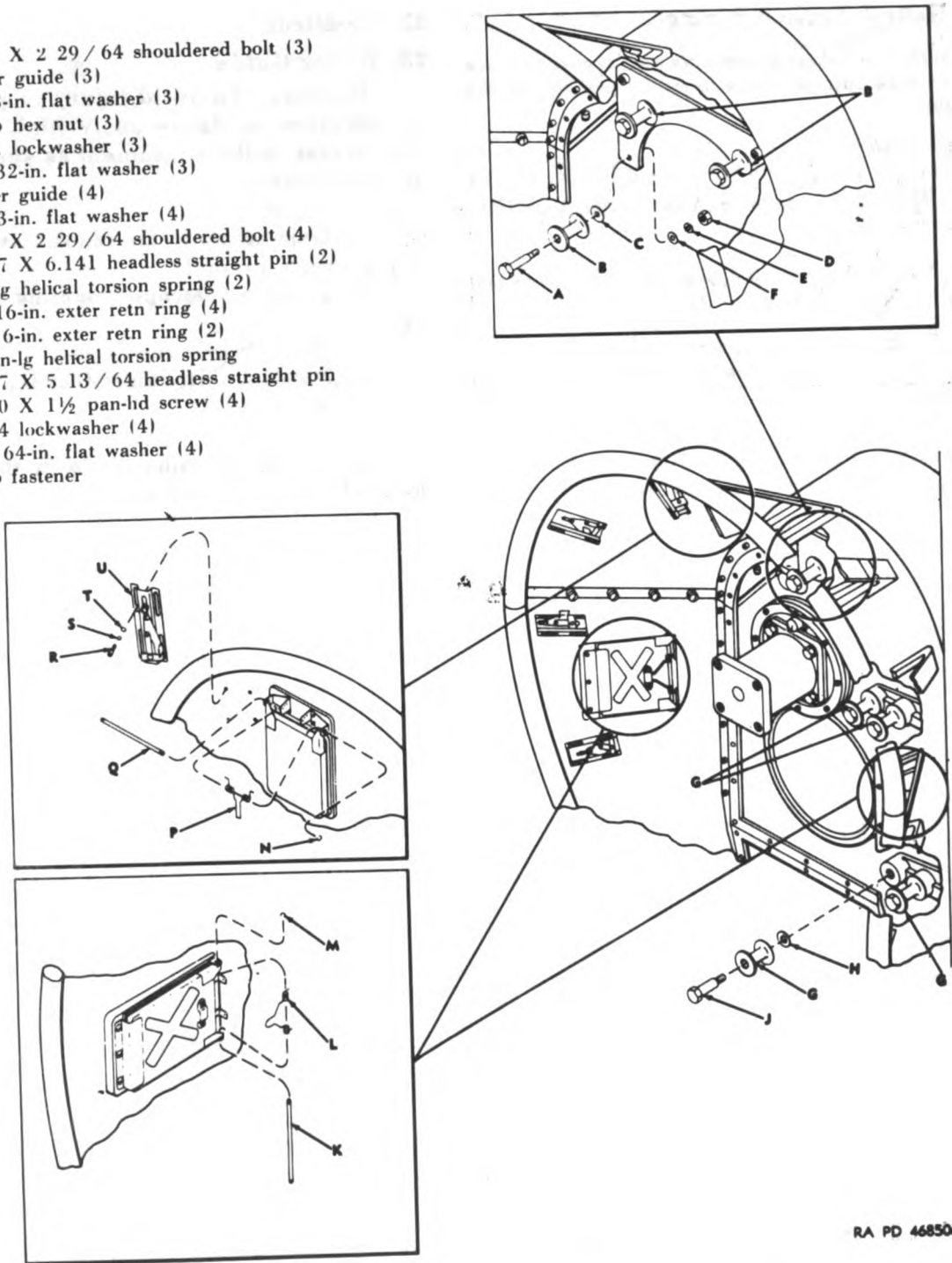
(3) Remove side cover (J).

(4) Remove roller guide (B or G, fig. 17, or 4, 7, or 9, fig. 17.1)

b. Installation.

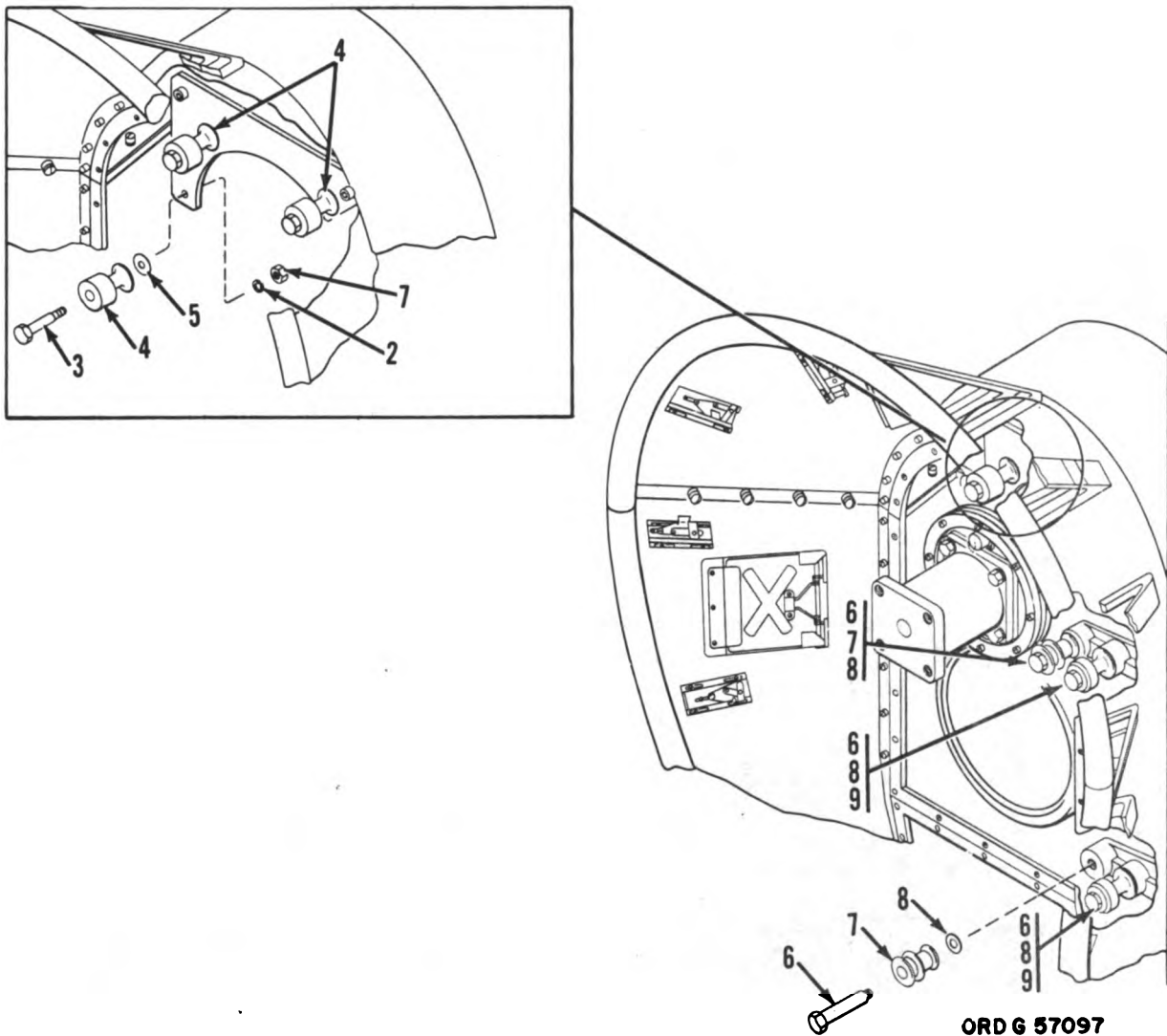
(1) Install the roller guide in the reverse order of removal, a above.

- A— $\frac{3}{8}$ -16 X 2 29/64 shouldered bolt (3)
 B—Roller guide (3)
 C—0.383-in. flat washer (3)
 D— $\frac{3}{8}$ -16 hex nut (3)
 E— $\frac{3}{8}$ -in. lockwasher (3)
 F—13/32-in. flat washer (3)
 G—Roller guide (4)
 H—0.383-in. flat washer (4)
 J— $\frac{3}{8}$ -16 X 2 29/64 shouldered bolt (4)
 K—0.187 X 6.141 headless straight pin (2)
 L—3-in.-lg helical torsion spring (2)
 M—3/16-in. exter retn ring (4)
 N—3/16-in. exter retn ring (2)
 P—2 3/8-in.-lg helical torsion spring
 Q—0.187 X 5 13/64 headless straight pin
 R—1/4-20 X 1 1/2 pan-hd screw (4)
 S—No. 4 lockwasher (4)
 T—17/64-in. flat washer (4)
 U—Flap fastener



RA PD 468504

Figure 17. Track antenna pedestal—data side—partially exploded view no. 3.



1— $\frac{3}{8}$ -16 hex nut (3)
 2— $\frac{3}{8}$ -in. lockwasher (3)
 3— $\frac{3}{8}$ -16 shouldered bolt (3)
 4—Roller guide 9012831 (3)

5—0.383-in. flat washer (3)
 6— $\frac{3}{8}$ -16 shouldered bolt (4)
 7—Roller guide 9012832 (2)
 8—0.383-in. flat washer (4)
 9—Roller guide 9154427 (2)

Figure 17.1. Range antenna pedestal—data side—partially exploded view.

Section II. ANTENNA PEDESTAL OR ANTENNA SUPPORT—DRIVE SIDE

24. Blower

Warning: All maintenance on blower shall be performed with MAIN POWER switch on the radar-power control-indicator in the off position.

a. Removal.

(1) Set the ANTENNA switch (fig. 49) to DISABLE, and engage azimuth transit lock (fig. 29).

Note. (2) below applies only to the 1RR; (2.1) below applies only to the MTR and TTR.

(2) Open the side door (1, fig. 17.2). Disconnect and tag the external leads for the power supply (7) from TB16. Remove the attaching hardware (2, 3, and 4), and remove the power supply.

(2.1) Remove air filter cover (W, fig. 18) and air-conditioning filter assembly (X).

(3) Partially remove the radome in accordance with the assembly and emplacement manual (para 3).

(4) Disconnect and tag the blower leads from the BLOWER switch (N).

(5) Release the lacing as necessary, and remove the blower leads from the cable between

the blower and switch.

(6) Remove blower (B) and gasket (CC).

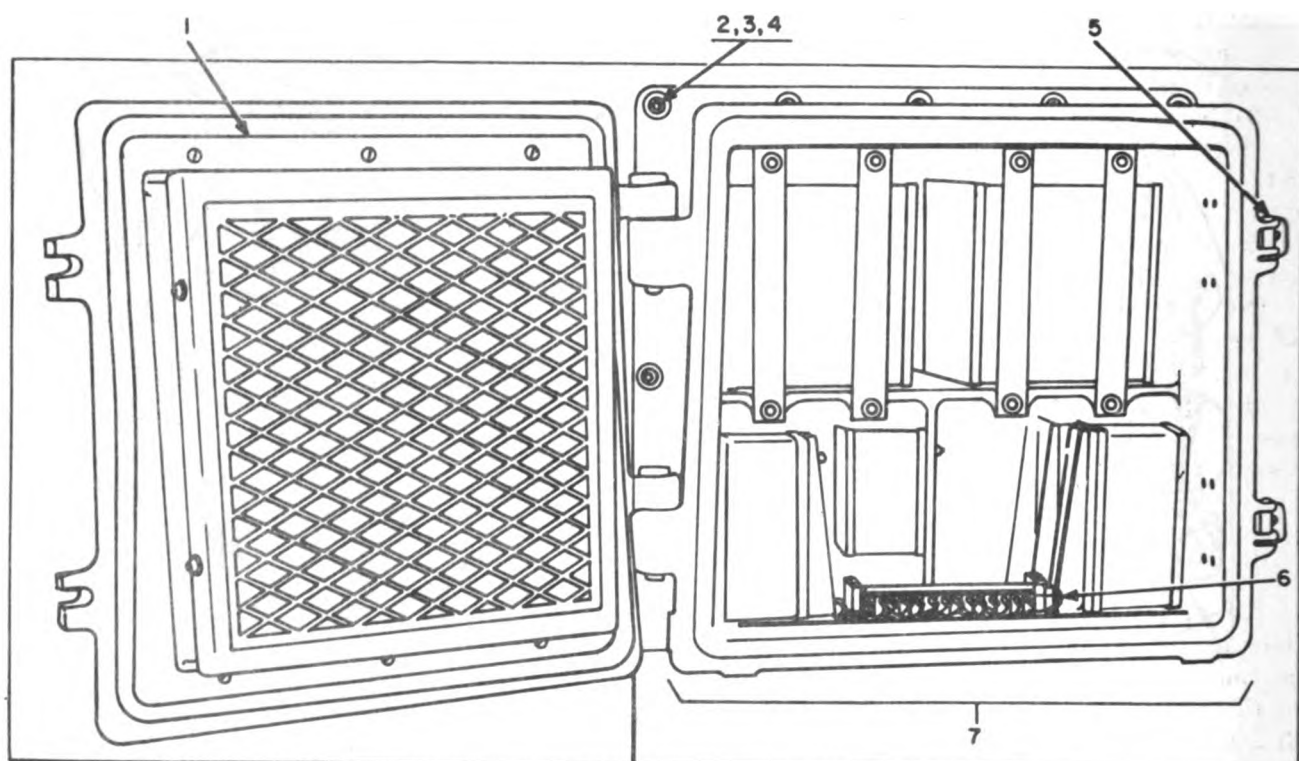
b. Installation.

(1) Install new gasket (CC) and the blower (B).

(2) Complete installation of the blower in the reverse order of removal, a (5) through (1) above.

25. Blower Switch (S7)

Warning: All maintenance on the BLOWER switch shall be performed with MAIN POWER switch on the radar-power control-indicator in the off position.



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- 1—Side door
- 2—5 / 16-18 x 1½ hex-socket-hd screw
- 3—5 / 16-in. lockwasher (16)
- 4—0.375-in. flat washer (16)

- 5—Clamp (2)
- 6—Terminal board TB1
- 7—Power supply

Figure 17.2. Range antenna pedestal—partial side view.

a. Removal.

(1) Gain access to the switch by performing the procedures of paragraph 24 a (1) and (2) or (2.1).

(2) Disconnect and tag the leads from

switch (N).

(3) Remove the switch.

b. Installation.

(1) Rotate the shaft of rotary switch (N) to the fully counter-clockwise position.

(2) Install the switch with the pin (S) in the shaft of the switch alined with the BLOWER OFF position.

(3) Install phenolic knob (P).

(4) Complete installation of the switch in the reverse order of removal, a (2) and (1) above.

26. Deflector Assembly

Note. There is a deflector also located on the data side of the antenna pedestal in the same position as on the drive side. Since the removal and installation procedures are identical, only the deflector on the drive side is covered.

a. Removal.

(1) Set the antenna switch (fig. 49) to DISABLE. Engage azimuth transit lock (fig. 29).

(2) Remove the radome in accordance with the assembly and emplacement manual (para 3).

(3) Remove eight hexagon-head bolts (E, fig. 18), lockwashers (D), and flat washers (C).

(4) Remove two spring pins (F6), two fillister-head screws (F5), lockwashers (F4), and flat washers (F3).

(5) Remove upper deflector (F1) and lower deflector (F2).

(6) Remove clamp (H) and the preformed packing (G).

b. Installation.

(1) Apply a light coating of special purpose grease DC33 to the inside of new preformed packing (G), and install the packing.

Note. Install deflector assembly (F) with drainage hole at bottom.

(2) Place upper deflector (F1) on track antenna pedestal. Apply corrosion preventive compound MIL C11796A, class 3, to two ¼-20 X 1 fillister-head screws (F5), and secure lower deflector (F2) to upper deflector (F1) with lockwashers, flat washers, and screws (F4, 3 and 5).

(3) Secure deflector assembly (F) to track antenna pedestal with eight 7/22-inch flat washers, no. 10 lockwashers, and no. 10-24 X ½ hexagon-head bolts (C, D, and E).

(4) Apply corrosion preventive compound

MIL C11796A, class 3, to two ¼ X ¾ spring pins (F6), and install the pins.

(5) Disengage elevation lock (fig. 29), and install the radome in accordance with the assembly and emplacement manual (para 3).

(6) Disengage azimuth transit lock (fig. 29), and set the ANTENNA switch to NORMAL position.

27. Shock Switches S12 and S13

Warning: All maintenance on S12 or S13 shall be performed with MAIN POWER switch on the radar-power control-indicator in the off position.

a. Removal.

(1) Gain access to the radome as specified in paragraph 11.11.2.

Note. (2) below applies only to S13.

(2) Partially remove the radome in accordance with the assembly and emplacement manual (para 3).

(3) Engage elevation lock (fig. 29).

(4) Remove cover assembly (A, fig. 19).

(5) Disconnect and tag leads from S12 (L) or S13 (G).

(6) Remove the switch.

b. Installation and Adjustment of S12.

(1) Install S12 (L) and connect the leads.

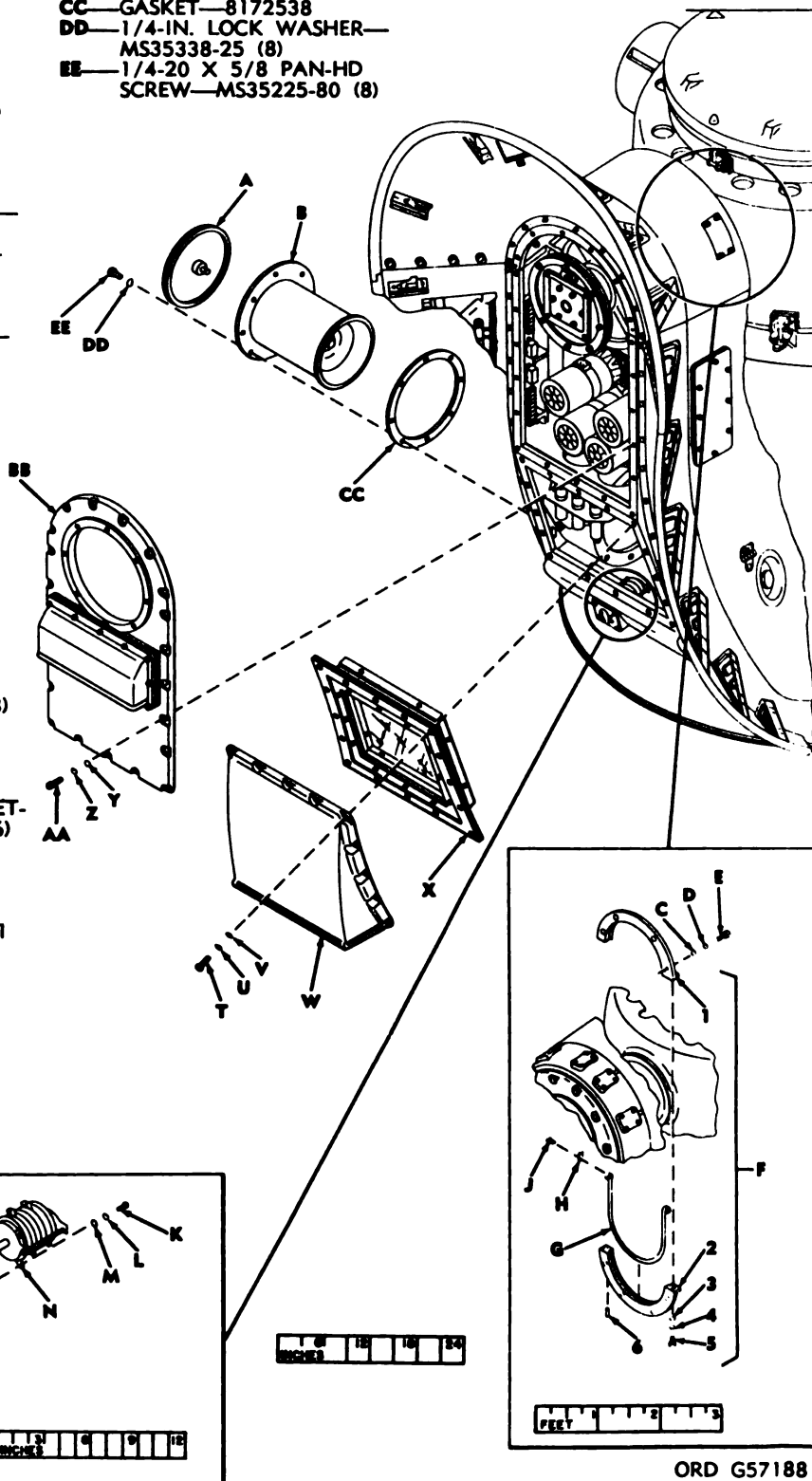
(2) Disengage elevation lock (fig. 29).

(3) Connect an ohmmeter (on the RX1 scale) between terminals 142 and 144 (fig. 20) on TB 19 (MTR or TTR) or terminals 132 and 133 (TRR-see fig. 21.1).

(4) Manually rotate the antenna in elevation until forward quadrant shock absorber (Q, fig. 21) is depressed. The meter shall indicate less than 2.0 ohms. Slowly increase the elevation angle until the meter indication changes slightly. Record the elevation position dial indication as viewed through the observation window (S, fig. 4) at this point. If it is not between -55 and -85 mils, adjust S12.

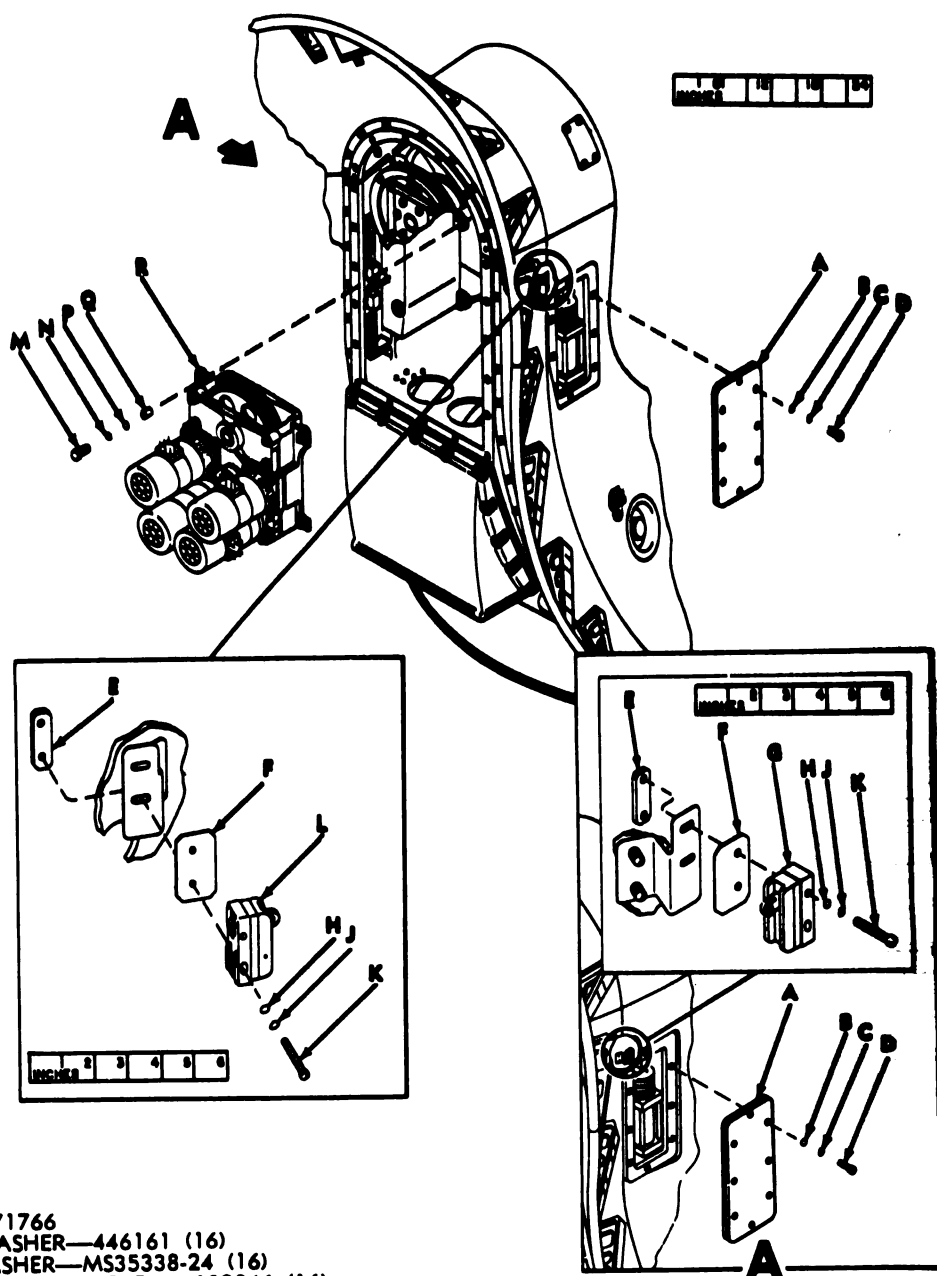
(5) If the meter indication is much larger than 2 ohms (approximately 200 ohms), remove the radome

- A—COVER—8172811
 B—BLOWER—8516219
 C—0.25-IN. FLAT WASHER—
 MS15795-209 (8)
 D—NO. 10 LOCK WASHER—
 MS35338-24 (8)
 E—NO. 10-24 X 1-1/2 HEX-HD
 BOLT—8531235 (8)
 F—DEFLECTOR (ASSY)—8511246
 1—(UPPER) DEFLECTOR—
 8511245
 2—(LOWER) DEFLECTOR—
 8511244
 3—0.281-IN. FLAT WASHER—
 MS15795-210 (2)
 4—1/4-IN. LOCK WASHER—
 MS35338-25 (2)
 5—1/4-20 X 1 FIL-HD
 SCREW—132273 (2)
 6—1/8 X 3/4 SPRING PIN—
 589750 (2)
 G—PREFORMED PACKING—
 8517815
 H—CLAMP—8517792
 J—NO. 4-40 X 3/16 FIL-HD
 SCREW—131820 (2)
 K—1/4-20 X 1/2 PAN-HD
 SCREW—MS35225-79 (4)
 L—1/4-IN. LOCK WASHER—
 MS35338-25 (4)
 M—0.281-IN. FLAT WASHER—
 MS15795-210 (4)
 N—ROTARY SWITCH (S7)—
 8519278
 P—PHENOLIC KNOB (FURN/W
 SWITCH—8519278)
 Q—NO. 10 LOCK WASHER
 (FURN/W SWITCH—8519278)
 R—NO. 10-24 X 7/16 RD-HD
 SCREW (FURN/W SWITCH—
 8519278)
 S—PIN
 T—5/16-18 X 1-1/2 HEX-SOCKET-
 HD SCREW—MS35457-53 (16)
 U—5/16-IN. LOCK WASHER—
 MS35338-26 (16)
 V—11/32-IN. FLAT WASHER—
 MS15795-212 (16)
 W—AIR FILTER COVER—9004341
 X—AIR CONDITIONING FILTER
 ASSY—9004366
 Y—11/32-IN. FLAT WASHER—
 MS15795-212 (21)
 Z—5/16-IN LOCK WASHER—
 MS35338-26 (21)
- AA—5/16-18 X 1-1/2 HEX-SOCKET
 HD SCREW—MS35457-53 (21)
 BB—SIDE COVER—8171017
 CC—GASKET—8172538
 DD—1/4-IN. LOCK WASHER—
 MS35338-25 (8)
 EE—1/4-20 X 5/8 PAN-HD
 SCREW—MS35225-80 (8)



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Figure 18. Track antenna pedestal—drive side—partially exploded view No. 1.



- A—COVER ASSY—8171766
- B—7/32-IN. FLAT WASHER—446161 (16)
- C—NO. 10 LOCK WASHER—MS35338-24 (16)
- D—NO. 10-24 X 5/8 FIL-HD SCREW—132046 (16)
- E—PLATE—8173994
- F—INSULATOR—8000726
- G—(SHOCK) SWITCH (S13)—7601946
- H—5/32-IN. FLAT WASHER—131014 (4)
- J—NO. 6 LOCK WASHER—MS35338-22 (4)
- K—NO. 6-32 X 1-1/8 FIL-HD SCREW—425292 (4)
- L—(SHOCK) SWITCH (S12)—7601946
- M—3/8-16 X 1-1/2 HEX-HD BOLT—9003514 (4)
- N—3/8-IN. LOCK WASHER—MS35338-27 (4)
- P—0.4375-IN. FLAT WASHER—8170970 (4)
- Q—0.375-IN-ID PLAIN STEEL BUSHING—8171626 (4)
- R—ANTENNA DRIVE—8170973

ORD G16954

Figure 10. Track antenna pedestal—drive side—partially exploded view No. 2.

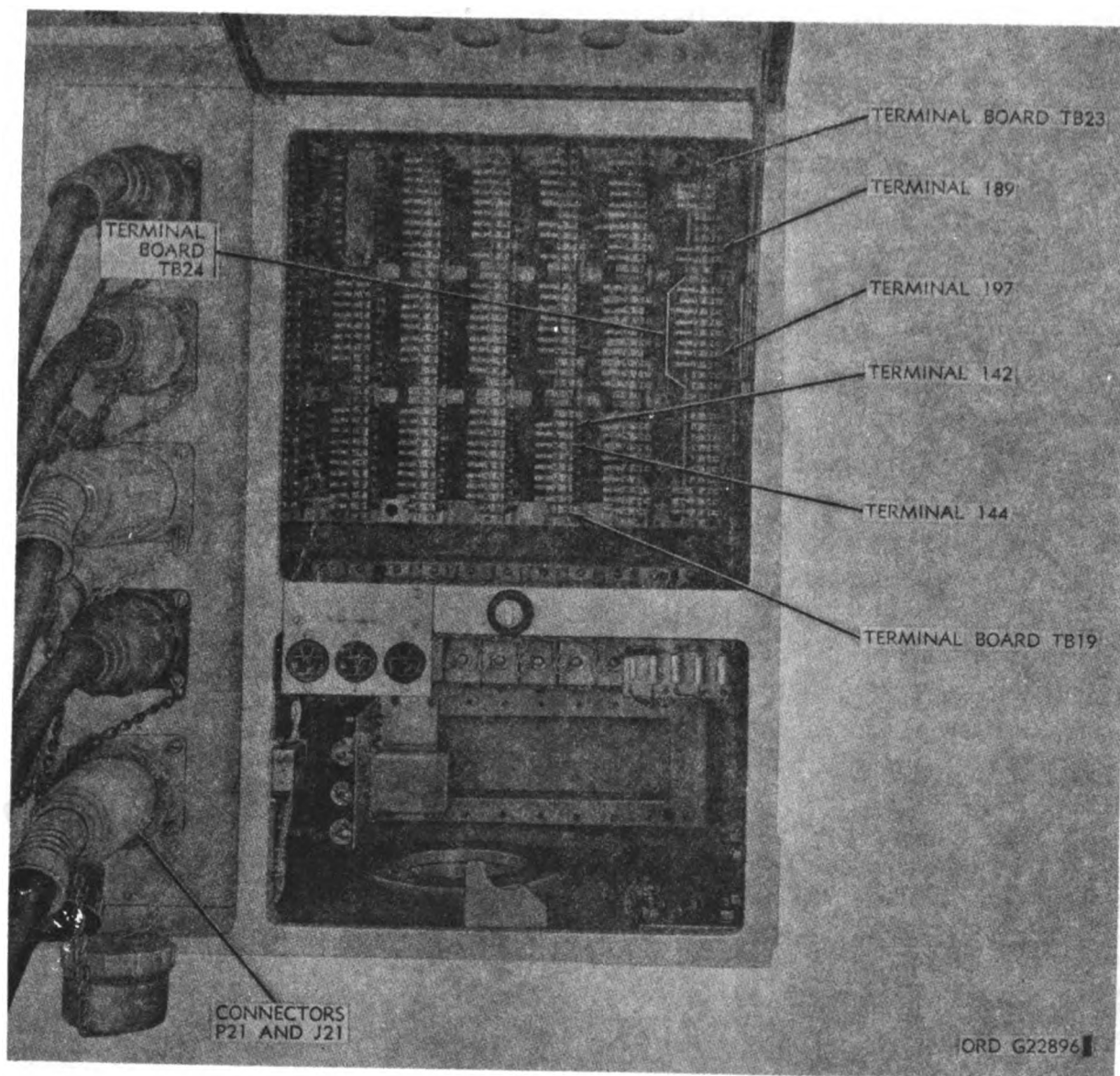
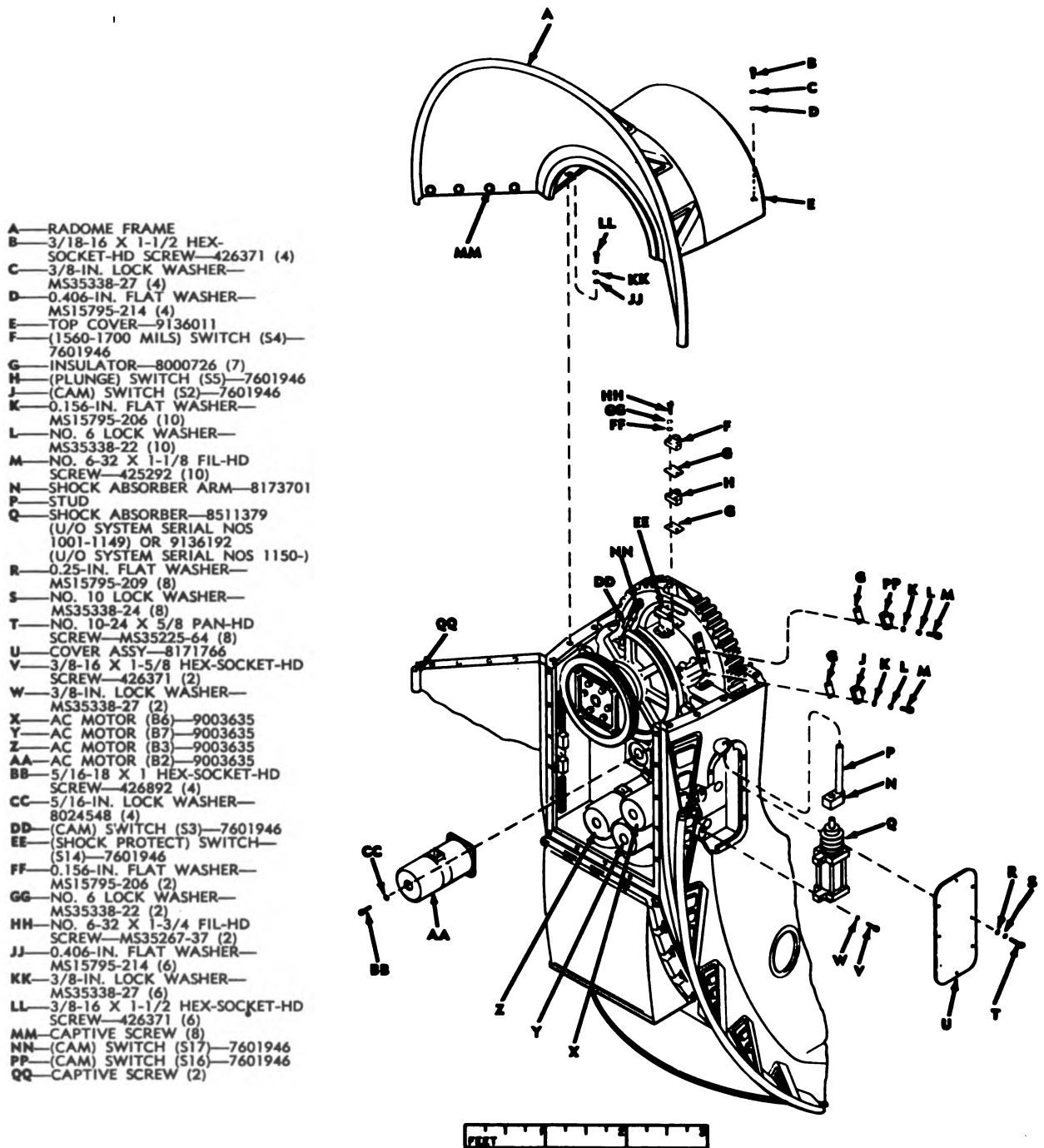


Figure 20. Asimuth drive equipment enclosure—terminal boards.



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Figure 21. Track antenna pedestal—drive side—partially exploded view No. 3.

in accordance with the assembly and emplacement manual (para 3), deflector assembly (para 26a), side cover (BB, fig. 18), to cover (E, fig. 21), with radome frame (A, fig. 21) attached, and position switch S2 (J, fig. 21) farther down on the bracket. Repeat (4) and (5).

(6) Set antenna elevation angle to approximately 30 degrees in the forward quadrant. Depress the forward shock absorber, and insert a wood block (Fig. 22) so that the shock absorber remains depressed. The meter shall indicate approximately 200 ohms. Slowly decrease the antenna elevation angle until the meter indicates less than 2.0 ohms. Record the elevation position

transmitter dial indication at this point. Release the shock absorber.

(7) Subtract the indication obtained in (6) above from the indication obtained in (4) above. If the result is between 10 and 40 mils, omit (8) below.

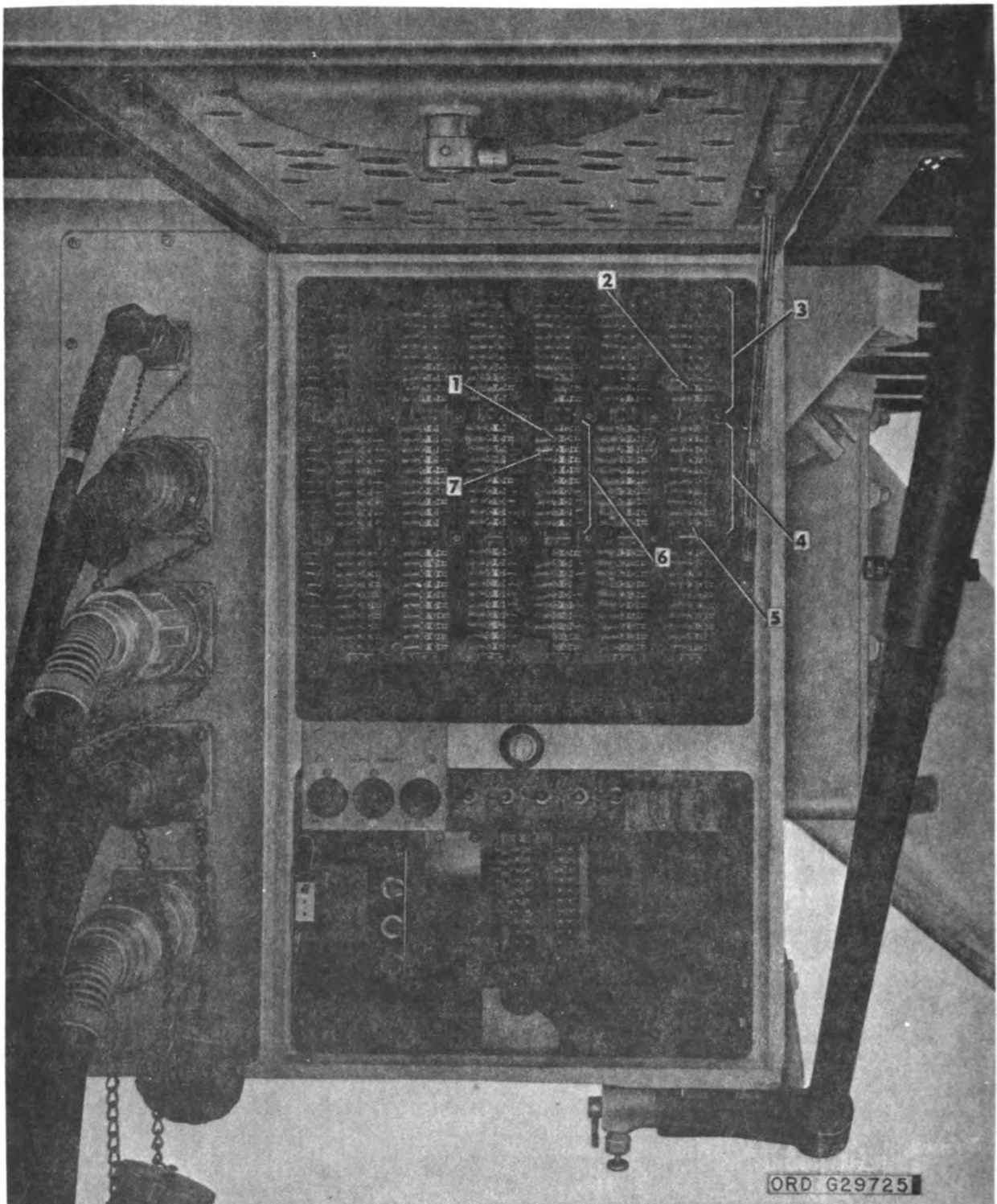
(8) Reposition S2 (J, fig. 21) on the bracket, and repeat (4) through (7) above.

(9) Install the equipment in the reverse order of removal, *b* (5) and *a* (4) through (1) above.

c. Installation and Adjustment of S13.

(1) Install S13 (G, fig. 19), and connect the leads.

(2) Disengage elevation lock (fig. 29).



1—Terminal 132
2—Terminal 189

3—Terminal board TB23
4—Terminal board TB24

5—Terminal 200
6—Terminal board TB18

7—Terminal 133

Figure 21.1. Range-antenna support base—terminal boards.

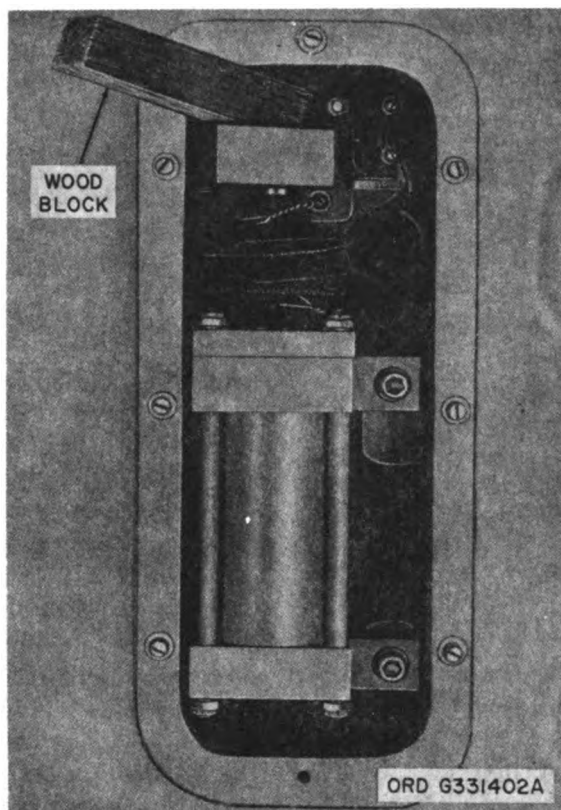


Figure 22. Shock absorber—depressed.

(3) Connect an ohmmeter (on the R X 1 scale) between terminals 142 and 144 (fig. 20) on TB19 (MTR or TTR), or terminals 132 and 133 (TRR—see fig. 21.1).

Note. The dumped quadrant shock absorber is located on the drive side of the track antenna pedestal opposite the forward quadrant shock absorber (Q, fig. 21).

(4) Manually rotate the antenna in elevation until the dumped quadrant shock absorber is depressed. The meter shall indicate less than 2.0 ohms. Slowly increase the antenna elevation angle until the meter indication changes slightly. Record the elevation position transmitter dial indication as viewed through the observation window (S, fig. 4). If it is not between 3255 and 3285 mils, adjust S13.

(5) If the meter indication is much larger than 2 ohms (approximately 200 ohms), remove the deflector assembly (para 26 a), side cover (BB, fig. 18), top cover (E, fig. 21) with radome frame (A, fig. 21) attached, and position cam

switch S3 (DD) farther down on the bracket. Repeat (4) above.

(6) Manually set antenna elevation angle to approximately 30° in the dumped quadrant. Depress the dumped quadrant shock absorber, and insert a wooden block (fig. 22) so that shock absorber remains depressed. The meter shall indicate approximately 200 ohms. Slowly decrease the antenna elevation angle until the meter indicates less than 2.0 ohms. Record the elevation position transmitter dial indication at this point. Release the shock absorber.

(7) Subtract the indication obtained in (6) above from that obtained in (4) above. If the result is between 10 and 40 mils, omit (8) below.

(8) Reposition S3 (DD, fig. 21) on bracket, and repeat (4) through (7) above.

(9) Install top cover (E, fig. 21) with radome frame (A) attached, side cover (BB, fig. 18), and the deflector assembly (para 26 b).

(10) Install cover assembly (A, fig. 19).

(11) Install radome; disengage azimuth transit lock (fig. 29); and set the ANTENNA switch to NORMAL.

28. Removal and Installation of Cam Switches S2, S3, S16, and S17, 1,560—1,700 Mils Switch S4, Plunge Switch S5, or Shock Protect Switch S14

Warning: All maintenance on switches S2, S3, S4, S5, S14, S16, and S17 shall be performed with TARGET POWER switch or MISSILE POWER switch on radar-power control-indicator or TRR POWER switch on range-radar-power control-indicator, as applicable, in the off position.

a. Removal.

Note. The removal and installation procedures given are for each of the seven switches. Any one switch may be removed and installed separately.

(1) Set the ANTENNA switch to DIS-ABLE, and engage azimuth transit lock (fig. 29).

(2) Remove the radome in accordance with the assembly and emplacement procedures manual (para 3), and engage elevation lock (fig. 29).

(3) Remove side cover (BB, fig. 18).

(4) Remove deflector assembly (para 26 a).

(5) Remove top cover (E, fig. 21) with radome frame (A) attached.

(6) Disconnect and tag the leads from switch (EE, F, H, J, or DD).

(7) Remove the switch.

b. Installation of 1,560—1,700 Mils Switch S4, Plunge Switch S5, or Shock Protect Switch S14.

(1) Install switch (EE, F, or H), and connect the leads.

(2) Install top cover (E, fig. 21) with radome frame (A) attached.

(3) Install the deflector assembly (para 26 b).

(4) Install side cover (BB, fig. 18).

(5) Disengage elevation lock (fig. 29), and install radome.

(6) Disengage azimuth transit lock, and set the ANTENNA switch to NORMAL.

c. Installation and Adjustment of Cam Switch S2.

(1) Install switch (J, fig. 21), and connect the leads.

(2) Perform the procedures of paragraph

27 b (2) through (11).

d. Installation and Adjustment of Switch S3.

(1) Install switch (DD, fig. 21), and connect the leads.

(2) Perform the procedures of paragraph 27 c (2) through (11).

d.1 Installation and Adjustment of S16.

(1) Install S16 (PP, fig. 21), and connect the leads.

(2) Disengage elevation lock (fig. 29).

(3) Disconnect P21 (fig. 20) from J21 (MTR or TTR), or the blue lead from terminal 200 (TRR—see fig. 21.1).

(4) Connect an ohmmeter (on the R X 1 scale) between terminal 197 on TB24 and terminal 189 on TB23 (MTR or TTR), or terminals 189 and 200 (TRR—see fig. 21.1).

(5) Manually rotate the antenna in elevation until forward quadrant shock absorber (Q, fig. 21) is depressed. The meter shall indicate less than 2.0 ohms. Record the elevation position transmitter dial indication as viewed through observation window (S, fig. 4).

(6) Slowly increase the antenna elevation angle until the meter indication changes to infinity resistance. Record the elevation position transmitter dial indication as viewed through the observation window.

(7) Subtract the indication obtained in (6) above from the indication obtained in (5) above. If the result is between 5 and 15 mils, omit (8) below.

(8) Reposition S16 (PP, fig. 21) on the bracket, and repeat (4) through (7) above.

(9) Install top cover (E, fig. 21) with radome frame (A, fig. 21) attached, deflector assembly (para 26 b), and side cover (BB, fig. 18).

(10) Connect P21 (fig. 20) to J21 (MTR or TTR), or the blue lead to terminal 200 (TRR).

(11) Install the radome in accordance with the assembly and emplacement manual (para 3); disengage azimuth transit lock (fig. 29); and set the ANTENNA switch to NORMAL.

d.2. Installation and Adjustment of S17.

(1) Install S17 (NN, fig. 21), and connect the leads.

- (2) Disengage elevation lock (fig. 29).
- (3) Disconnect P21 (fig. 20) from J21 (MTR or TTR), or the blue lead from terminal 200 (TRR, fig. 21.1).
- (4) Connect an ohmmeter (on the RX 1 scale) between terminal 197 on TB24 and terminal 189 on TB23 (MTR or TTR), or terminals 189 and 200 (TRR, fig. 21.1).

Note. The dumped quadrant shock absorber is located on the drive side of the track-antenna pedestal opposite forward-quadrant shock absorber (Q, fig. 21).

- (5) Manually rotate the antenna in elevation until the dumped quadrant shock absorber is depressed. The meter shall indicate less than 2.0 ohms. Record the elevation position transmitter dial indication as viewed through the observation window (S, fig. 4).
- (6) Slowly increase the antenna elevation angle until the meter indication changes to infinity resistance. Record the elevation position transmitter dial indication as observed through the observation window.
- (7) Perform d.1 (7) through (11) above, adjusting S17 as necessary to obtain the 5- to 15-mil tolerance.

29. Antenna Drive

Warning: To avoid injury to personnel or exposure to dangerously high voltages, gain access to the equipment as specified in the procedures.

a. Removal.

- (1) Gain access to the radome as specified in paragraph 11.11.2.
- (2) Remove side cover (BB, fig. 18).
- (3) Disconnect and tag the leads from ac motors (X, Y, Z, and AA, fig. 21).

Note. TB2 and TB4 are located directly below TB1 (fig. 23) and TB3, respectively.

- (4) Disconnect and tag leads of motor-generators B4, B5, B8, and B9 from TB1, TB2, TB3, and TB4. Remove the leads from the cable clamp and from behind the inner wall.
- (5) Remove antenna drive (R, fig. 19).

b. Disassembly.

Note. The key letters in parentheses in (1) through (5) below refer to figure 25.

- (1) Remove ac motors (C) and motor-generators (J). Disassemble the ac motors and motor-generators and prepare bearings for grease 9150-00-753-4588.

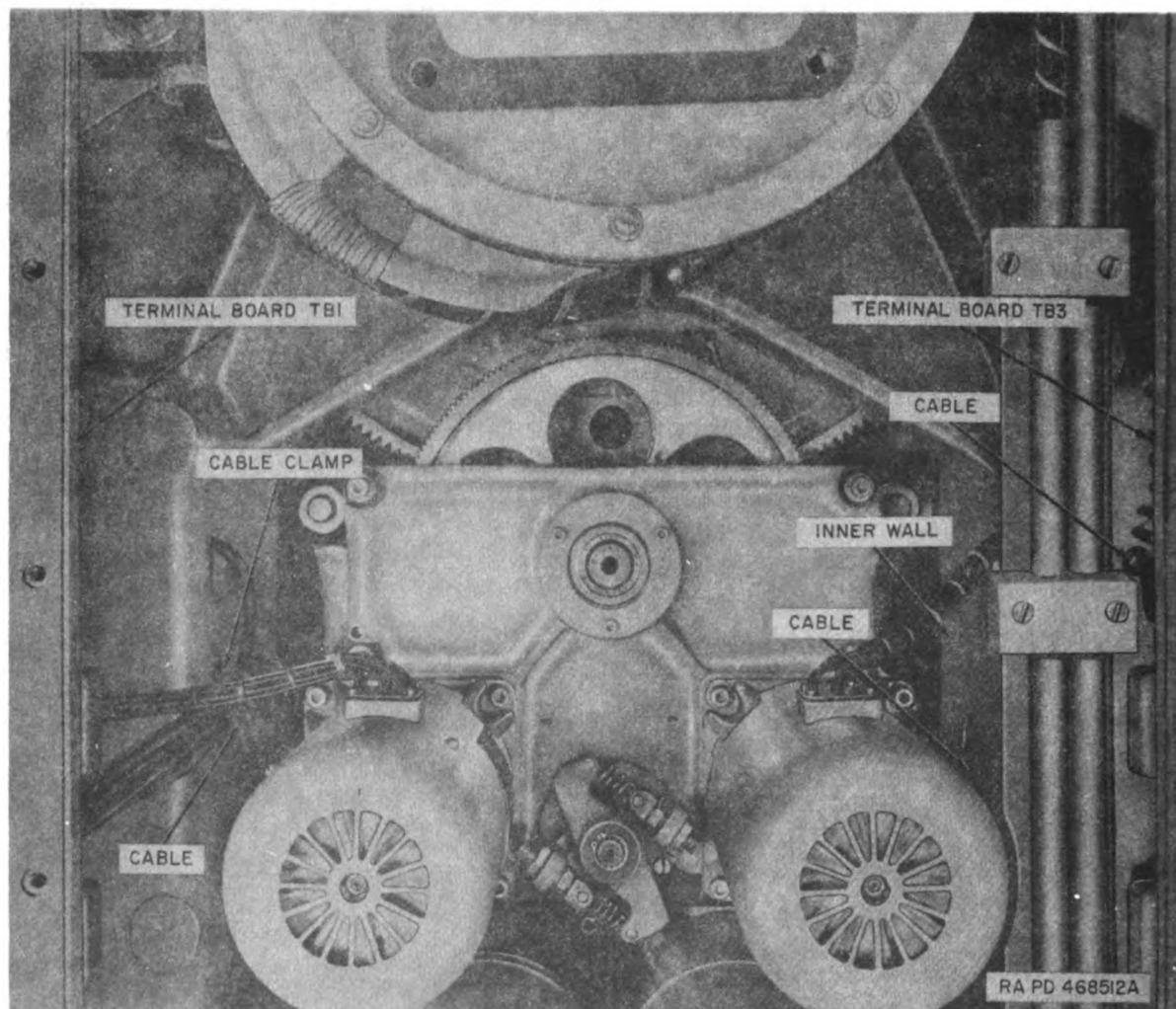


Figure 23. Antenna drive—locational view.

- (2) Remove cap (Q), retaining ring (D), and retaining ring (K).
- (3) Remove spur gear (N).
- (4) Remove ball bearing (P) and rigid coupling (M) from spur gear.
- (5) Remove ball bearing (L) from gear housing assembly (E).

Note. The key letters shown in parentheses in (6) through (11) below refer to figure 26 unless otherwise indicated.

- (6) Remove two springs (H).
- (7) Remove clevis ends arm (B) and arm (D).
- (8) Remove two rod end clevis assemblies (G) from arm (D).
- (9) Remove bearing cap (W), bearing cap (S), and shim (R).
- (10) Remove upper gear housing (J) and remove ball bearing (Q) and ball bearing (V) from housing.

- (11) Remove two tapered keys (A, fig. 27) and complete disassembly of antenna drive.

c. Assembly.

Note. The key letters shown in parentheses in (1) through (9) below refer to figure 27.

Note. Pack all bearings to be installed two-thirds full with grease 9150-261-8298 and apply film of grease 9150-261-8298 to all gear teeth and bearing bores.

- (1) Insert 1.8504-inch-od ball bearing (H) into gear housing (G).
- (2) Insert 0.625-inch-id needle roller bearing (B) and 0.675-inch-id needle roller bearing (D) into 18- and 32-tooth spur gear (C).
- (3) Place 0.879-inch flat washer (E) and spur gear (C) onto 14-, 32-, and 195-tooth spur gear (F).
- (4) Install spur gear in gear housing and secure with 0.618-inch external retaining ring (J).

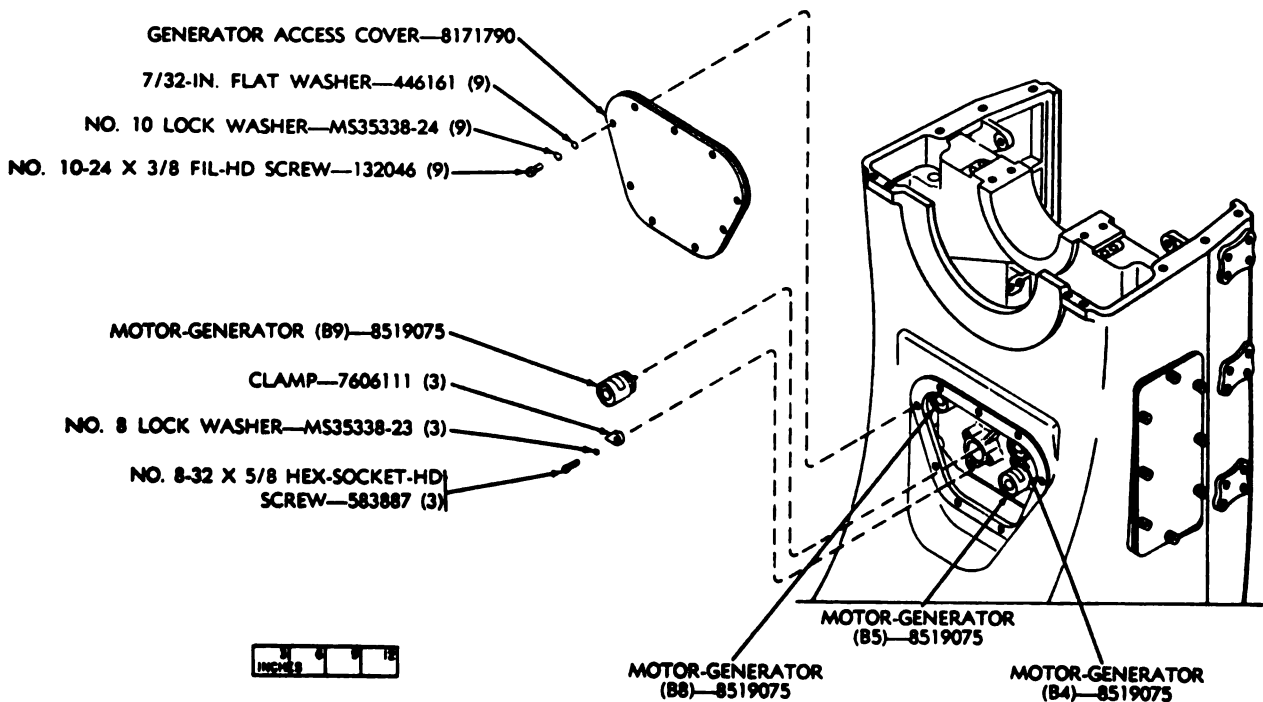
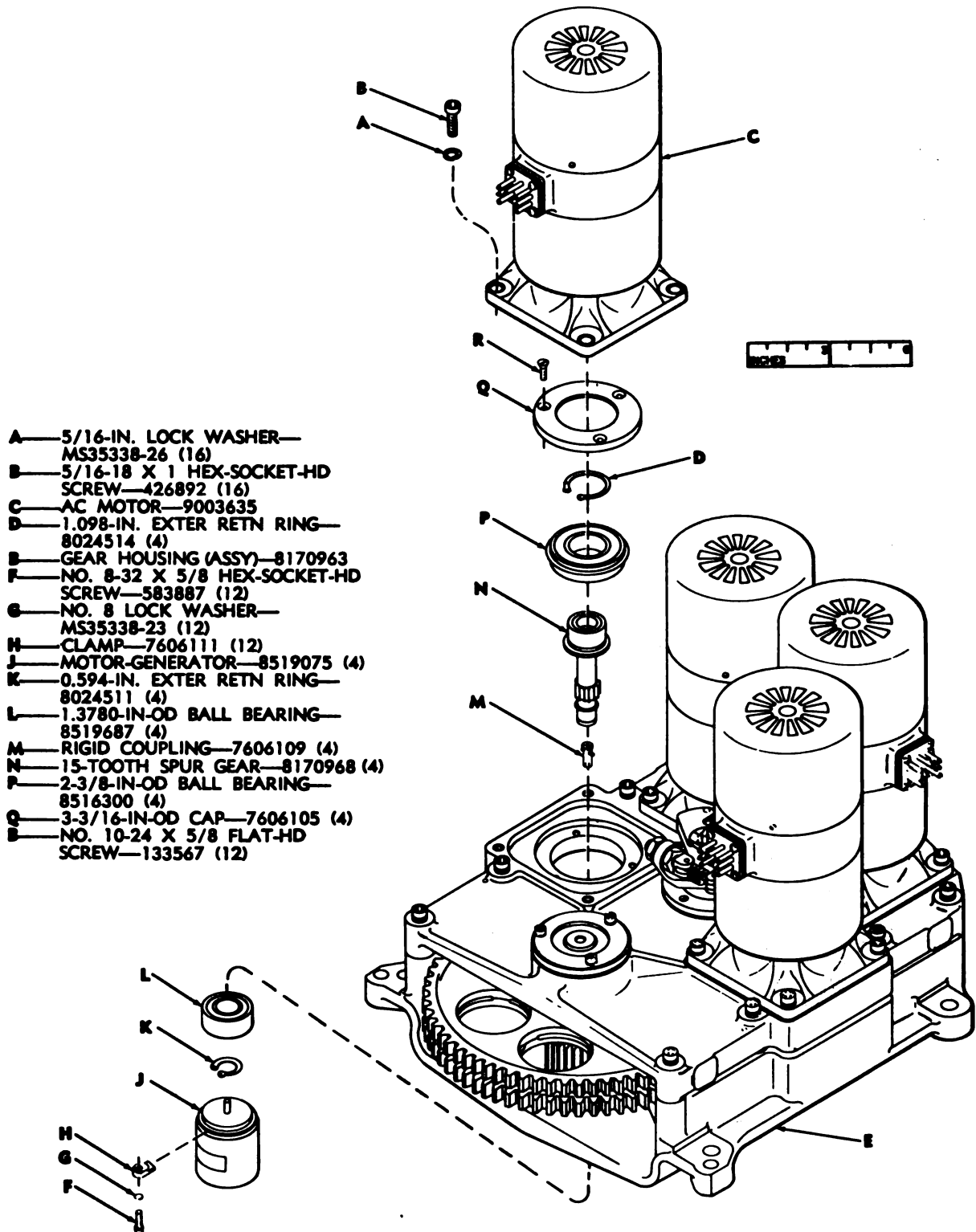


Figure 24. Motor-generators B4, B5, B8, and B9—locational view.

RA PD 468513



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Figure 25. Antenna drive - partially exploded view No. 1.

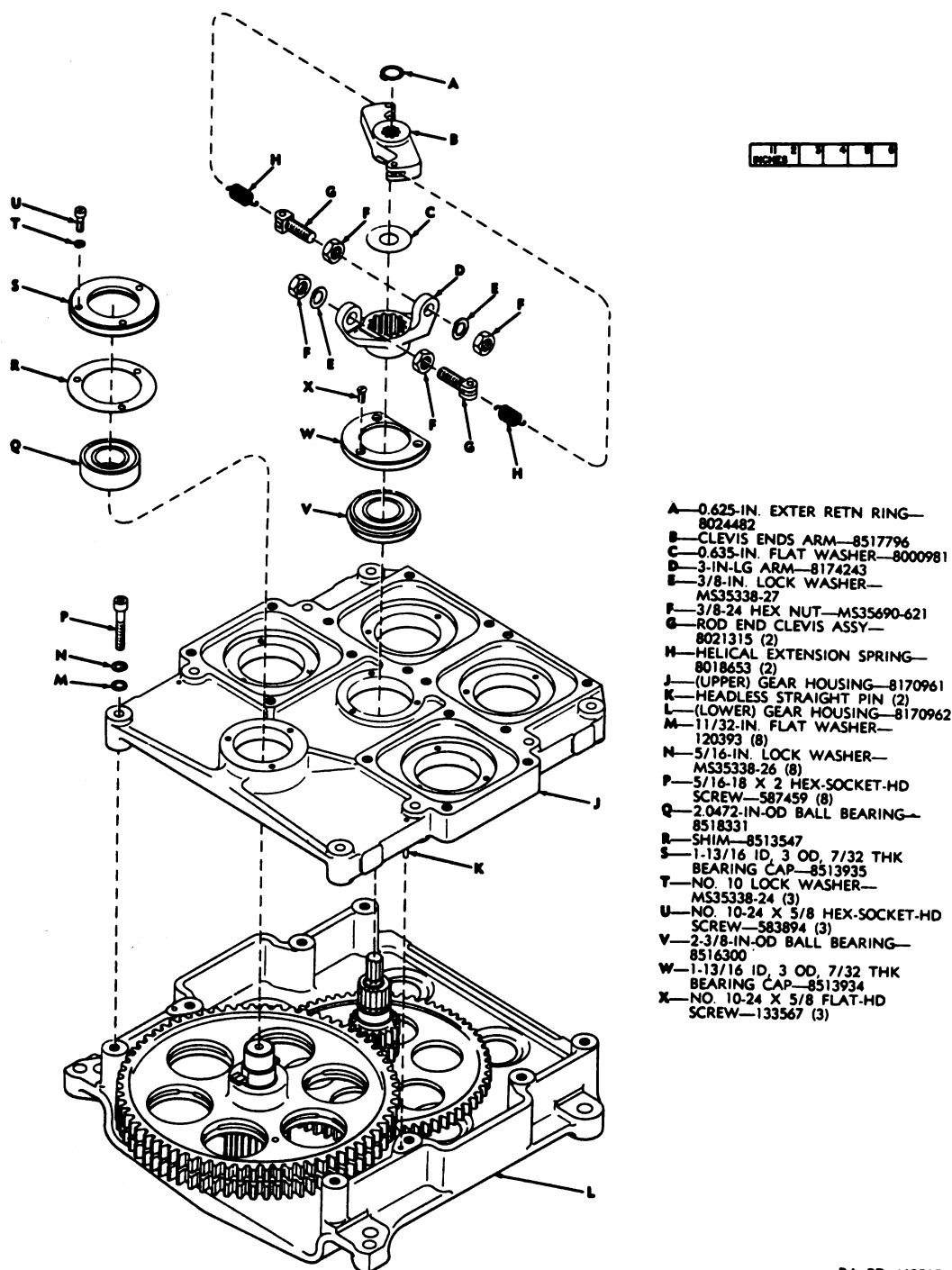


Figure 26. Antenna drive—partially exploded view No. 2.

RA PD 468515

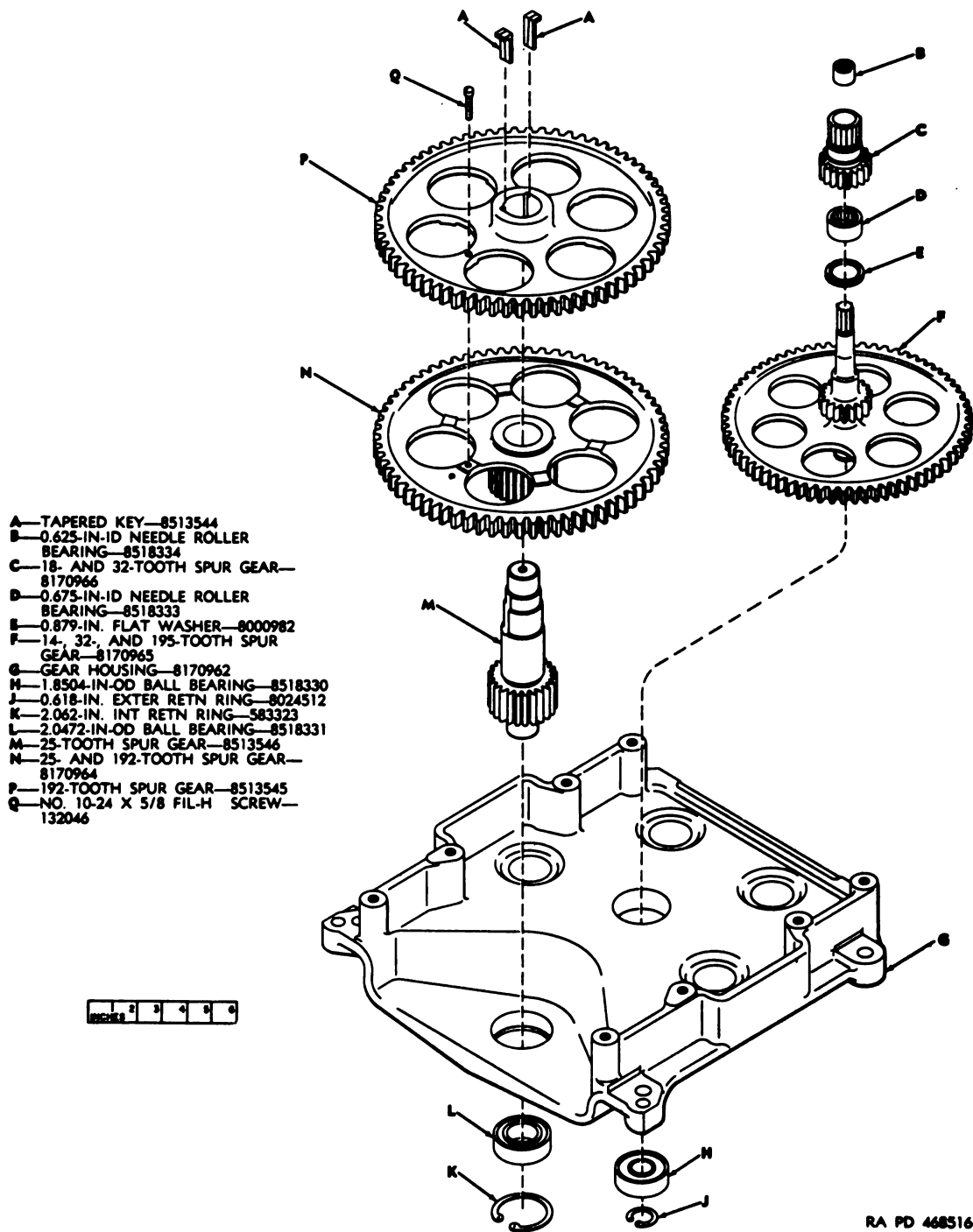


Figure 87. Antenna drive—partially exploded view No. 3.

(5) Install 2.0472-inch-od ball bearing (L) and 2.062-inch internal retaining ring (K).

(6) Install 25-tooth spur gear (M).

(7) Obtain a no. 10-24 X $\frac{5}{8}$ fillister-head screw (Q) from stock, and secure 192-tooth spur gear (P) to 25- and 192-tooth spur gear (N).

(8) Place gears (P and N) onto spur gear (M) so that the head of fillister-head screw will be away from the housing (G).

(9) Mesh spur gear (N) with spur gear (F); mesh spur gear (P) with spur gear (C); and install two tapered keys (A).

Note. (Deleted)

(10) Secure upper housing (J, fig. 26) to lower housing (L).

(11) Install 2.0472-inch-od ball bearing (Q) and 2 $\frac{3}{8}$ -inch-od ball bearing (V).

(12) Install shim (R) and 3-inch-od bearing cap (S).

(13) Apply sealing compound MIL-S-7124 to the threads of three no. 10-24 X $\frac{5}{8}$ flathead screws (X), and secure 3-inch-od bearing cap (W).

(14) Install two rod end clevis assemblies (G) on 3-inch-long arm (D).

(15) Install 3-inch-long arm, 0.635-inch flat washer (C), clevis ends arm (B), and 0.625-inch external retaining ring (A).

(16) Install two helical extension springs (H).

Note. (Deleted)

(17) Insert 1.378-inch-od ball bearing (L, fig. 25) into gear housing assembly (E).

(18) Press rigid coupling (M) into 15-tooth spur gear (N). Insert spur gear into housing; mesh with spur gear (F, fig. 27); and secure with 0.594-inch external retaining ring (K, fig. 25).

(19) Install 2 $\frac{3}{8}$ -inch-od ball bearing (P) and 1.098-inch external retaining ring (D).

(20) Apply sealing compound MIL-S-7124 to threads of three no. 10-24 x $\frac{5}{8}$ flathead screws (R), and secure 3 $\frac{3}{16}$ -inch-od cap (Q).

(21) Mesh splined shaft of ac motor (C) with spur gear (N), and secure motor to gear housing assembly (E).

(22) Insert shaft of motor-generator (J) into rigid coupling (M), and secure the generator to the housing.

d. Installation.

(1) Install antenna drive (R, fig. 19).

(2) Remove fillister-head screw (Q, fig. 27).

(3) Loosen and/or tighten four hexagon nuts (F, fig. 26) until average spacing between coils of two springs (H) is 0.05 ± 0.005 -inch along entire length of springs.

(4) Connect leads to ac motors (X, Y, Z, and AA, fig. 21).

Note. Terminal boards TB2 and TB4 are located directly below terminal boards TB1 (fig. 23) and TB3, respectively.

(5) Connect the leads of motor-generator B4 (fig. 24) and B5 to terminal boards TB1 (fig. 23) and TB2, and secure the leads in the clamp.

(6) Run the leads of generators B8 (fig. 24) and B9 behind inner wall (fig. 23), and connect the leads to terminal boards TB3 and TB4.

(7) Install side cover (BB, fig. 18).

(8) Disengage elevation lock (fig. 29), and close radome zipper door (fig. 3).

(9) Disengage azimuth transit lock (fig. 29), and set ANTENNA switch to NORMAL.

(10) Perform phase adjustments of motor-generators B4, B5, B8, and B9 in accordance with the general and preventive maintenance manual (para 3).

30. AC Motors B2, B3, B6, or B7

Warning: The track antenna pedestal contains voltages DANGEROUS TO LIFE. Turn MISSILE POWER switch or TARGET POWER switch, as applicable, on radar-power control panel to off position before starting repairs.

a. Removal.

(1) Gain access to the radome (para 11.11.2 a).

(2) Remove side cover (BB, fig. 18).

(3) Disconnect and tag leads from ac motor (X, Y, Z, or AA, fig. 21).

(4) Remove the ac motor.

b. Installation.

(1) Install ac motor (X, Y, Z, or AA, fig. 21).

(2) Connect the leads to the ac motor.

(3) Loosen and/or tighten four hexagon nuts (F, fig. 26) until the average spacing between the coils of two springs (H, fig. 26) is between 0.45 and 0.55 inch along entire length of springs.

(4) Install side cover (BB, fig. 18).

(5) Return the equipment to normal operation (para 11.11.2 b).

31. Motor-Generators B4, B5, B8, and B9

Warning: The track antenna pedestal contains voltages DANGEROUS TO LIFE. Turn MISSILE POWER switch or TARGET POWER switch, as applicable, on the radar-power control panel to off position before starting repairs.

a. Removal.

(1) Gain access to the radome (para 11.11.2 a).

(2) Remove side cover (BB, fig. 18).

(3) Remove generator access cover (fig. 24).

Note. Terminal boards TB2 and TB4 are located directly below terminal boards TB1 (fig. 23) and TB3, respectively.

(4) Disconnect and tag the leads of motor-generator B4 (fig. 24), B5, B8, or B9 from terminal board TB1 (fig. 23), TB2, TB3, or TB4, and remove the leads from the cable clamp.

(5) Remove the motor-generator.

b. Installation.

(1) Install the motor-generator.

(2) Position and reconnect the motor-generator leads. Leads are positioned as follows:

(a) B4 or B5—through the cable sleeving and secured with a clamp.

(b) B8 or B9—behind the inner wall.

(3) Loosen and / or tighten four hexagon nuts (F, fig. 26) until the average spacing between the coils of two springs (H, fig. 26) is between 0.045 and 0.055 inch along the entire length of the springs.

(4) Install side cover (BB, fig. 18).

(5) Install generator access cover (fig. 24).

(6) Return the equipment to normal operation (para 11.11.2 b).

(7) Perform phase adjustments of motor-generator B4, B5, B8, or B9 in accordance with the general and preventive maintenance manual (para 3).

32. Shock Absorber

Warning: All field maintenance on shock absorber shall be performed with the MISSILE POWER switch or TARGET POWER switch, as applicable, on the radar-power control panel in the off position.

a. Removal.

Note. There is also a shock absorber located on the drive side of the track antenna pedestal opposite the shock absorber (Q, fig. 21). Since the removal and installation procedures are identical, only one shock absorber is covered.

- (1) Set antenna disable switch S1 (A, fig. 49) to the ANTENNA DISABLE position and engage the azimuth transit lock (fig. 29).
- (2) Set rotary switch S7 (N, fig. 18) to the off position.
- (3) Open the radome zipper door (fig. 3) and engage the elevation lock (fig. 29).
- (4) Remove the cover assembly (U, fig. 21).
- (5) Remove two hexagon-socket-head screws (V) and the lockwashers (W).
- (6) Hold the arm (N) in place, lower the shock absorber (Q) until the shock absorber is clear of the arm, and remove the shock absorber.
- (7) Remove the arm with the stud (P) attached.

b. Installation.

- (1) Insert the stud (P) of the arm into the antenna pedestal.
- (2) Hold the arm in place and install the shock absorber (Q). Install two hexagon-socket-head screws (V) and the lockwashers (W).
- (3) Install the cover assembly (U).
- (4) Disengage the elevation lock (fig. 29) and close the radome zipper door (fig. 3).
- (5) Set rotary switch S7 (N, fig. 18) to the on position.
- (6) Disengage the azimuth transit lock (fig. 29) and set antenna disable switch S1 (A, fig. 49) to the NORMAL position.

33. Field Maintenance of Antenna Stop 8515248

Warning: The track antenna pedestal contains voltages DANGEROUS TO LIFE. Turn the MIS-SILE POWER switch or TARGET POWER switch, as applicable, on the radar power control panel to the off position before starting repairs.

a. Removal.

- (1) Engage the azimuth transit lock (fig. 29). Set antenna disable switch S1 (A, fig. 49) to the ANTENNA DISABLE position.

- (2) Set rotary switch S7 (N, fig. 18) to the off position.
- (3) Remove the radome in accordance with TM 9-1430-251-10.
- (4) Remove the side cover (BB, fig. 18).
- (5) Remove the deflector assembly (para 26a).
- (6) Remove the cover (K, fig. 28) and tag and disconnect the leads from sensitive switch S11 (EE10).
- (7) Remove the top cover (C) with the radome frame (A) attached.
- (8) Remove the spring pin (G) and remove the handle assembly (H) and preformed packing (J).
- (9) Remove the antenna stop (EE).

b. Disassembly.

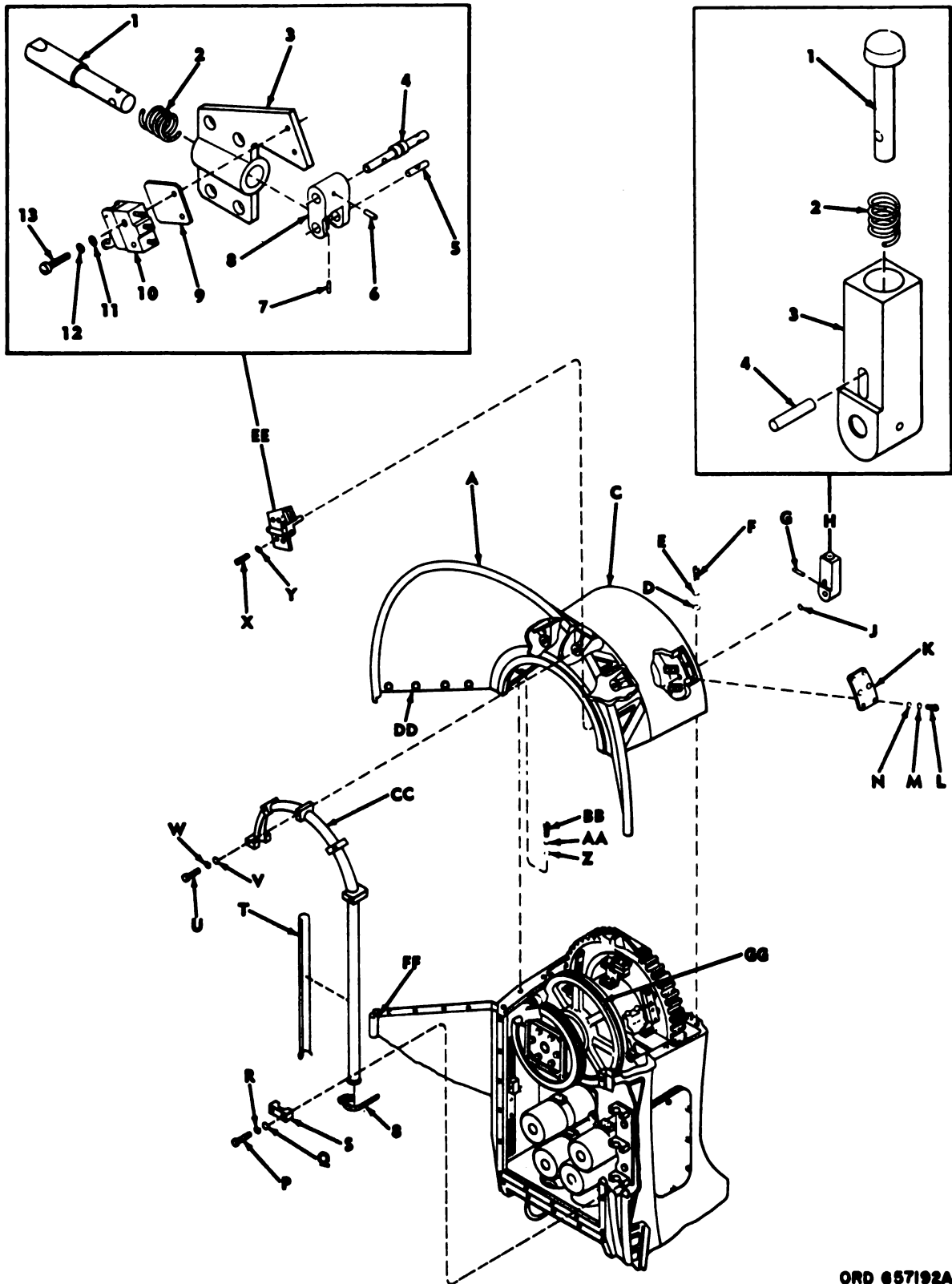
- (1) Remove sensitive switch S11 (EE 10).
- (2) Remove the spring pin (EE6) and remove the shaft (EE4).
- (3) Remove the spring pin (EE7) and remove the headless straight pin (EE5), clevis (EE8), headed straight pin (EE1), and the compression spring (EE2).

c. Assembly.

- (1) Place the compression spring (EE2) onto the headed straight pin (EE1).
- (2) Insert the headed straight pin into the housing (EE3) and secure the clevis (EE8) to the headed straight pin with the headless straight pin (EE5).
- (3) Install the spring pin (EE7).
- (4) Secure the shaft (EE4) in the clevis with the spring pin (EE6).
- (5) Install sensitive switch S11 (EE10).

d. Installation.

- (1) Install the antenna stop (EE) in the top cover (C).
- (2) Place the new preformed packing (J) onto the shaft of the antenna stop and secure the handle assembly (H) to the shaft with the spring pin (G).
- (3) Install the top cover with the radome frame (A) attached.
- (4) Connect the leads to sensitive switch S11 (EE10) and install the cover (K).
- (5) Install the deflector assembly (para 26b).
- (6) Install the side cover (BB, fig. 18).
- (7) Install the radome in accordance with TM 9-1430-251-10.



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Figure 28. Track antenna pedestal—drive side—partially exploded view No. 4.

A	— Radome frame	X	— 3/8-16 x 3/4 hex.-socket-hd screw MS16997-97 (4)
B	— Hose clamp 9975052-4	Y	— 3/8-in. lockwasher MS35338-27 (4)
C	— Top cover 9136010	Z	— 0.406-in. flat washer MS15795-214 (6)
D	— 0.406-in. flatwasher MS15795-214 (4)	AA	— 3/8-in. lockwasher MS35338-27 (6)
E	— 3/8-in. lockwasher MS35338-27 (4)	BB	— 3/8-16 x 1-1/2 hex.-socket-hd screw MS16997-101 (6)
F	— 3/8-16 x 1-1/2 hex.-socket-hd screw MS16997-101 (4)	CC	— Cable guide 10167689
G	— 1/8 x 3/4 spring pin MS16562-224	DD	— Captive screw (8)
H	— Handle assembly 8515249	EE	— Antenna stop 8515248
	1 — 0.3116 x 2-9/16 headed straight pin 8515251		1 — 0.7493 x 3-7/8 headed straight pin 8515258
	2 — 9/16-in.-dia helical compression spring 8515252		2 — 23/32-in. -dia helical compression spring 8515259
	3 — Handle 8515250		3 — Housing 8515260
	4 — 0.187 x 3/4 spring pin MS171590		4 — Shaft 8515254
J	— Performed packing 9003220		5 — 1/4 x 1-1/8 headless straight pin 8515256
K	— Cover 8515263		6 — 1/8 x 3/4 spring pin MS16562-224
L	— No. 10-24 x 7/16 pan-hd screw MS35225-62 (6)		7 — 3/32 x 9/16 spring pin MS16562-214
M	— No. 10 lockwasher MS35338-24 (6)		8 — Clevis 8515255
N	— 0.25-in. flat washer MS15795-209 (6)		9 — Insulator 8000726
P	— No. 10-24 x 2-1/4 pan-hd screw MS35297-59 (6)		10 — Sensitive switch (S11) SS07B20
Q	— No. 10 flat washer MS27183-14 (6)		11 — 0.156-in. flat washer MS15795-206 (2)
R	— No. 10 lockwasher MS35338-27 (6)		12 — No. 6 lockwasher MS35338-22 (2)
S	— Guide clamp 10167687 (3)		13 — No. 6-32 x 1-1/8 hex.-socket-hd screw 9000724 (2)
T	— Cable guide 10167688	FF	— Captive screw (2)
U	— 3/8-16 x 3 hex.-hd cap screw MS35297-70 (5)	GG	— Pulley
V	— 3/8-in. flat washer MS27183-14 (5)		
W	— 3/8-in. lockwasher MS35338-27 (5)		

Figure 28. Track antenna pedestal—drive side—partially exploded view No. 4—legend.

- (8) Set rotary switch S7 (N, fig. 18) to the on position.
- (9) Disengage the azimuth transit lock (fig. 29) and set antenna disable switch S1 (A, fig. 49) to the NORMAL position.

34. Field Maintenance of Handle Assembly 8515249

Warning: All field maintenance on the handle assembly shall be performed with the MISSILE POWER switch or TARGET POWER switch, as applicable, on the radar power control panel in the off position.

a. Removal and Disassembly.

- (1) Engage the azimuth transit lock (fig. 29). Set antenna disable switch S1 (A, fig. 49) to the ANTENNA DISABLE position.
- (2) Set rotary switch S7 (N, fig. 18) to the off position.
- (3) Open the radome zipper door (fig. 3).
- (4) Remove the spring pin (G, fig. 28) and remove the handle assembly (H) and preformed packing (J).

- (5) Disassemble the handle assembly.

b. Assembly and Installation.

- (1) Place the compression spring (H2) onto the headed straight pin (H1). Insert the headed straight pin into the handle (H3) and insert the spring pin (H4).
- (2) Place the new preformed packing (J) onto the shaft of the antenna stop (EE) and secure the handle assembly (H) to the shaft with the spring pin (G).
- (3) Close the radome zipper door (fig. 3).
- (4) Set rotary switch S7 (N, fig. 18) to the on position.
- (5) Disengage the azimuth transit lock (fig. 29) and set antenna disable switch S1 (A, fig. 49) to the NORMAL position.

35. Removal and Installation of Cable Guide 10167689

Warning: The track antenna pedestal contains voltages DANGEROUS TO LIFE. Turn the MISSILE POWER switch or TARGET POWER switch, as applicable, on the radar power control panel to the off position before starting repairs.

a. Removal.

- (1) Set antenna disable switch S1 (A, fig. 49) to the ANTENNA DISABLE position and engage the azimuth transit lock (fig. 29).
- (2) Set rotary switch S7 (N, fig. 18) to the off position.
- (3) Open the radome zipper door (fig. 3) and engage the elevation lock (fig. 29).
- (4) Remove the side cover (BB, fig. 18).
- (5) Remove the hose clamp (B, fig. 28) and three guide clamps (S).
- (6) Remove the cable guide (T and CC).

b. Installation.

- (1) Install the cable guide (CC) over the cable and pulley (GG). The pulley should be alined in the center of the cable guide trough.

Note. To aline the pulley in the center of the cable guide trough, it may be necessary to loosen the four setscrews securing the pulley to the support arm. Move the pulley backward or forward as necessary and tighten the four setscrews.

- (2) Place the cable guide (T) around the cable and install three guide clamps (S). The mating edges of the cable guides shall butt evenly the full length of the assembly.
- (3) Install the hose clamp (B).
- (4) Disengage the elevation lock (fig. 29) and manually raise and lower the antenna throughout the arc of normal travel, checking to insure that the cable moves through the cable guide without binding.
- (5) Install the side cover (BB, fig. 18) and close the radome zipper door (fig. 3).
- (6) Set rotary switch S7 (N, fig. 18) to the on position.
- (7) Disengage the azimuth transit lock (fig. 29) and set antenna disable switch S1 (A, fig. 49) to the NORMAL position.

35.1. Removal and Installation of Vaneaxial Fan 8517073

Warning: The track antenna pedestal contains voltages DANGEROUS TO LIFE. Turn the MIS-SILE POWER switch or TARGET POWER switch, as applicable, on the radar power control panel to the off position before starting repairs.

a. Removal.

- (1) Set antenna disable switch S1 (A, fig. 49) to the ANTENNA DISABLE position.
- (2) Remove the radome in accordance with TM 9-1430-251-10.
- (3) Manually position the track antenna reflector assembly (fig. 29) on the track antenna pedestal as shown, and engage the elevation lock and azimuth transit lock.
- (4) Release the four clamps and open the cover.
- (5) Release two power supply clamps (fig. 30) and open the track RF control-power supply group to the position shown.
- (6) Disconnect connector P26 (L, fig. 31) from connector J10.
- (7) Close the track RF control-power supply group (fig. 30).
- (8) Disengage the elevation lock.
- (9) Remove the track antenna reflector assembly in accordance with TM 9-1430-251-10.
- (10) Loosen two electrical clamps (fig. 28.1) and remove the vaneaxial fan and clamps.

b. Installation.

- (1) Place the electrical clamps (fig. 28.1) over the ends of the air ducts.
- (2) Position the vaneaxial fan as shown and secure between the air ducts with two clamps.
- (3) Install the track antenna reflector assembly in accordance with TM 9-1430-251-10.
- (4) Disengage the elevation lock (fig. 29).
- (5) Manually position the track antenna reflector assembly on the track antenna pedestal as shown, and engage the elevation lock.
- (6) Release the four clamps and open the cover.
- (7) Release two power supply clamps (fig. 30) and open the track RF control-power supply group to the position shown.
- (8) Connect connector P26 (L, fig. 31) to connector J10.
- (9) Close the track RF control-power supply group (fig. 30).
- (10) Close the cover (fig. 29).
- (11) Install the radome in accordance with TM 9-1430-251-10.
- (12) Disengage the elevation lock and azimuth transit lock (fig. 29). Set antenna disable switch S1 (A, fig. 49) to the NORMAL position.

35.1.1. Antenna Support

Warning: The track antenna pedestal and track antenna support contain voltages **DANGEROUS TO LIFE**. Turn the **TARGET POWER** or **MISSILE POWER** switch on the radar-power control-indicator to **OFF** before starting repairs.

a. Removal.

(1) Remove the antenna reflector assembly in accordance with the assembly and emplacement manual (para 3).

(2) Loosen the two setscrews in each of the nuts which secure the elevation and azimuth tilt-adjusting screws (3 and 6, fig. 43.7). Remove the nuts.

(3) Back out the azimuth and elevation tilt-adjusting screws until they are free.

(4) Remove the screws, clamps, and springs around the antenna support.

Note. A field change may have replaced the original bolts with setscrews.

(5) Remove the eight bolts (or setscrews) which secure the antenna support to the receiver-transmitter housing. Remove the antenna support.

b. Installation.

Note. Do not lubricate the mating surface on the antenna support.

(1) Clean the surface of the antenna support, which mates with ring 8171965 (on the antenna reflector) of any foreign matter or caked paint. Clean the grease from the antenna support and the receiver-transmitter housing.

(2) Clean the bullet-shaped nuts, the adjustment screw retainers, the adjustment screws, and the nut which secures the adjustment screw. Be sure that all old grease is removed.

(3) Moderately lubricate the items cleaned in (2) above with aircraft grease 9150-269-8255.

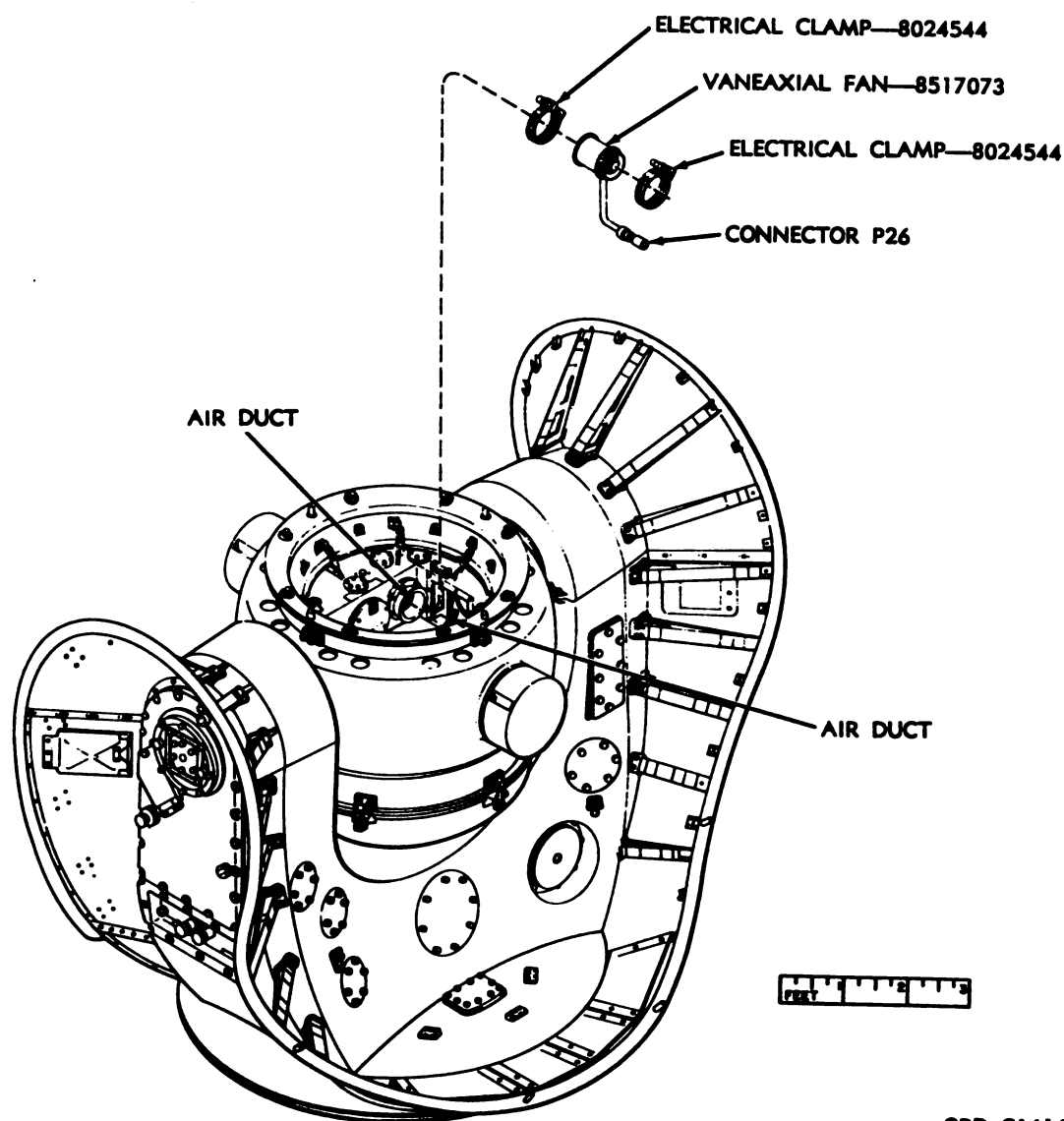
Note. The eight securing bolts must be positioned, but not tightened. The adjustment referenced in (7) below cannot be performed with the bolts tightened.

(4) Assemble the antenna support on the receiver-transmitter housing in the reverse order of removal a (5) through (3) above.

(5) Perform the procedures of paragraph 51.2, step 1.

(6) Replace the antenna reflector assembly in accordance with assembly and emplacement manual (para 3).

(7) Perform the reflector tilt check as prescribed in the track check procedures (para 3).



ORD G16160

Figure 28.1. Removal and installation of vaneaxial fan.

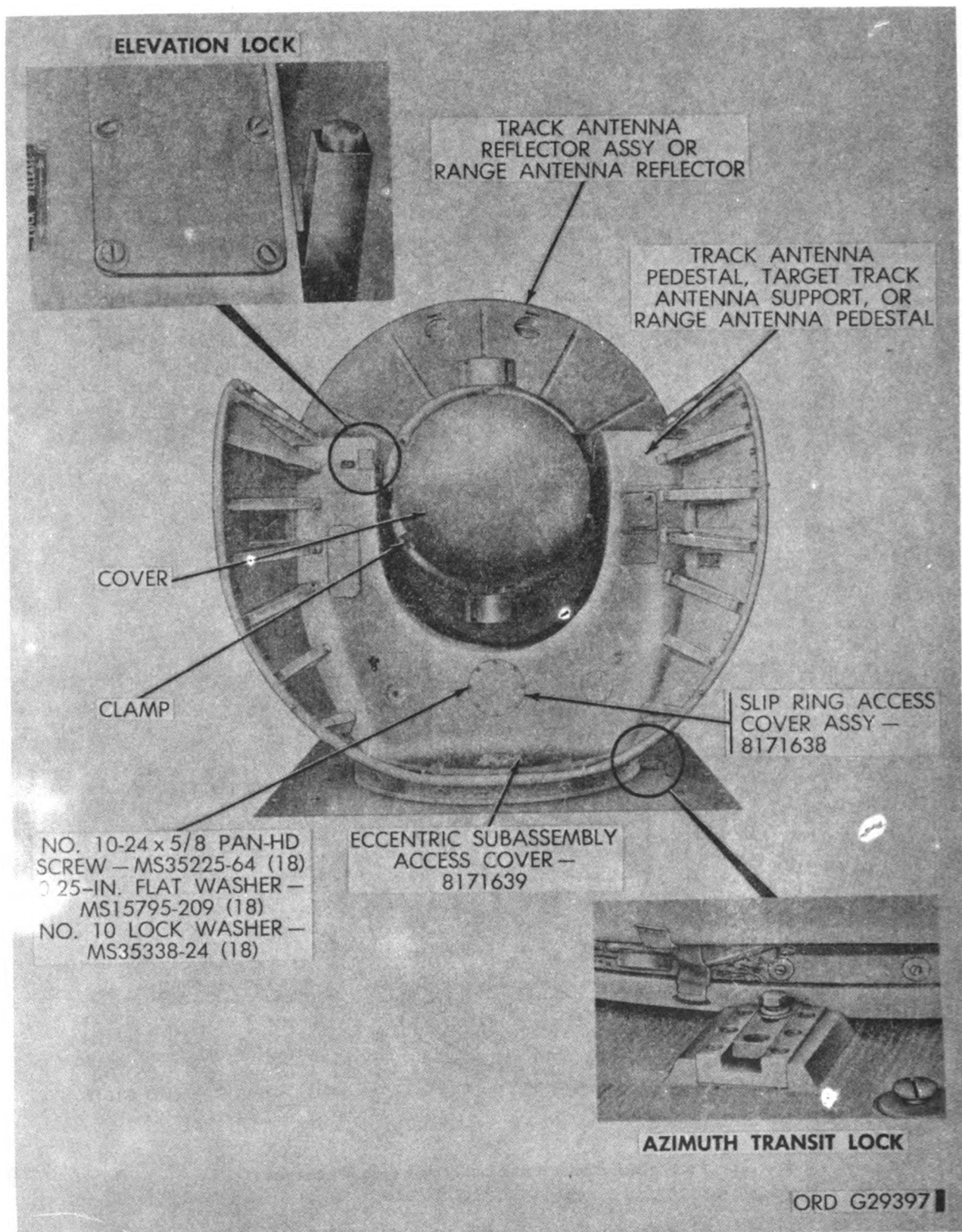


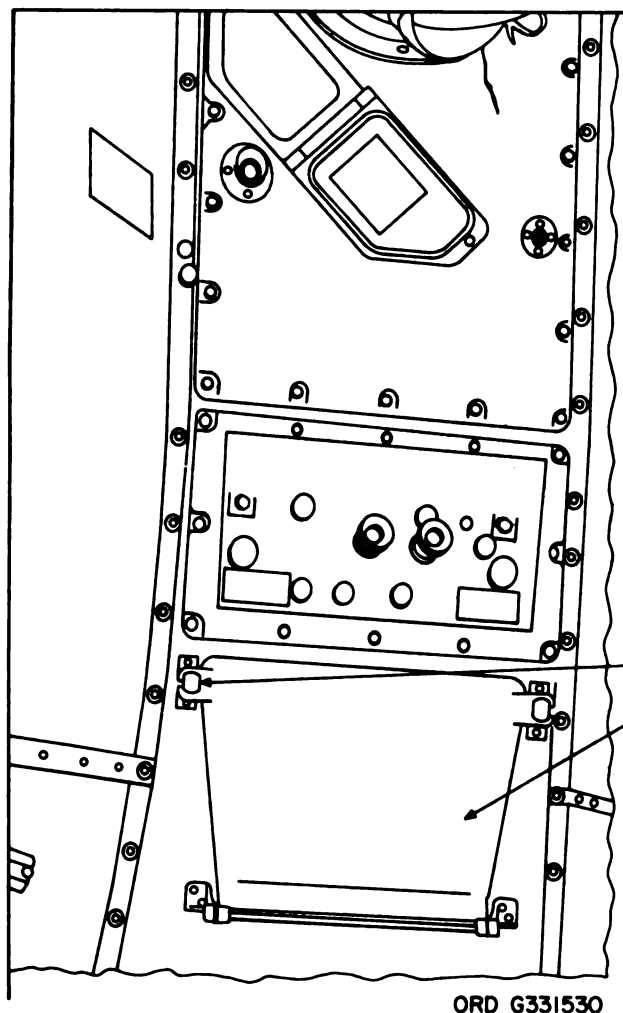
Figure 29. Track or range antenna assembly—radome removed.

CHAPTER 2.1

MAINTENANCE OF COMPRESSOR-DEHYDRATOR-TRR

35.2-35.12. (Deleted)

Figures 29.1 and 29.2 (Deleted).



1 — Clamp (2)

2 — Cover

Figure 29.3. Range antenna pedestal—data side.

Warning: The range receiver-transmitter contains voltages DANGEROUS TO LIFE. Gain access to the equipment as specified in the procedures.

35.13. Compressor-Dehydrator

a. Removal.

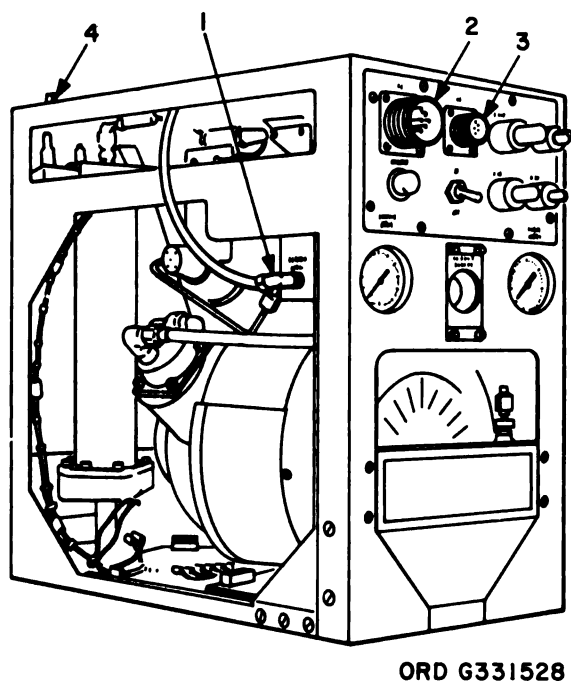
- (1) Gain access to the rear of the TRR main RF enclosure (para 11.11.3).
- (2) Disconnect connectors P31 and P33 from connectors J1 (2, fig. 29.4) and J2 (3, fig. 29.4), respectively.
- (3) Disconnect the hose from outlet hose connection (1, fig. 29.5).
- (4) Disconnect hose assembly (1, fig. 29.4) from the STORAGE TANK connection.
- (5) Loosen four fasteners (4, fig. 29.4), and remove the compressor-dehydrator.

b. (Deleted)

c. (Deleted).

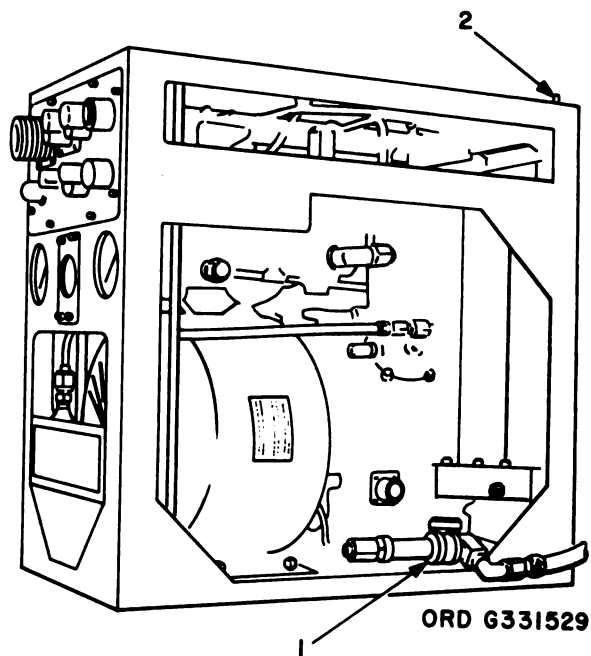
d. Installation.

- (1) Install the compressor in the reverse order of removal, a above.
- (2) Perform the waveguide pressurization check in accordance with the track check procedures manual (para 3).



- 1—Storage hose connection
- 2—Connector J1
- 3—Connector J2
- 4—Fastener (4)

Figure 29.4. Compressor-dehydrator storage tank—outlet side.



- 1—Outlet hose connection
- 2—Fastener (4)

Figure 29.5. Compressor-dehydrator—output side.

35.14 – 35.27 (Deleted)

CHAPTER 3

MAINTENANCE OF RECEIVER-TRANSMITTER—TTR AND MTR

Section I. MODULATOR

36. Interlock Switch Assemblies.

Warning: Voltages DANGEROUS TO LIFE exist in the modulator. Gain access to the modulator as specified in the procedures.

a. Removal.

(1) Gain access to the modulator as specified in para 11.11.3.

(2) Remove cover assembly (JJ, fig. 33) from the interlock switch assembly (Y).

(3) Tag and disconnect the external leads, and remove the interlock switch assembly.

Note. Interlock switch assembly 9136180 contains switches S3 and S4. Interlock switch assembly 9145836 contains only S4. Omit instructions concerning S3 in *b* and *c* below when performing maintenance on interlock switch assembly 9145836.

b. Disassembly.

(1) Disconnect leads from switch S3 (F, fig. 34) and switch S4 (D).

(2) Remove switches S3 and S4 and associated switch actuator adapters (E and T).

(3) Unscrew and remove rod assembly (H).

(4) Remove two spring pins (R), and remove cam (S).

(5) Remove two retaining rings (A) and one flat washer (M); remove camshaft (N).

(6) Remove spring (Q).

c. Assembly.

(1) Screw rod assembly (H) into hole (P) in camshaft (N). Insert the cam into the camshaft

as shown in figure 35. Using the holes in the camshaft as a guide, drill and ream two holes through the cam for a 0.062 X ¼ spring pin. Remove the cam and rod assembly from the camshaft.

(2) Insert camshaft (N, fig. 34) through lower side of chassis assembly (C), and slide torsion spring (Q) onto the camshaft; secure the camshaft to the chassis assembly.

(3) Screw rod assembly (H) into hole (P).

(4) Secure the spring to the chassis assembly with flat washer (L), lockwasher (K), and screw (J). Hook end of the spring over rod assembly (H) so that the rod assembly will swing outward when released.

(5) Insert cam (S) into camshaft as shown in figure 35. Secure cam with two 0.062 X ¼ spring pins (R).

Note. Discard the mounting hardware furnished with switch actuator adapters (E and T), if new switch actuator adapters are being installed.

(6) Install switch S3 (F) and switch S4 (D).

(7) Check that S3 and S4 actuate when the end of rod assembly (H) is flush against the outer edge of chassis assembly (C). If the switches do not actuate as specified, loosen three hexagon-socket-head screws (B), and adjust the switches to meet the requirement specified. Tighten the screws following adjustment.

(8) Connect the leads to S3 and S4.

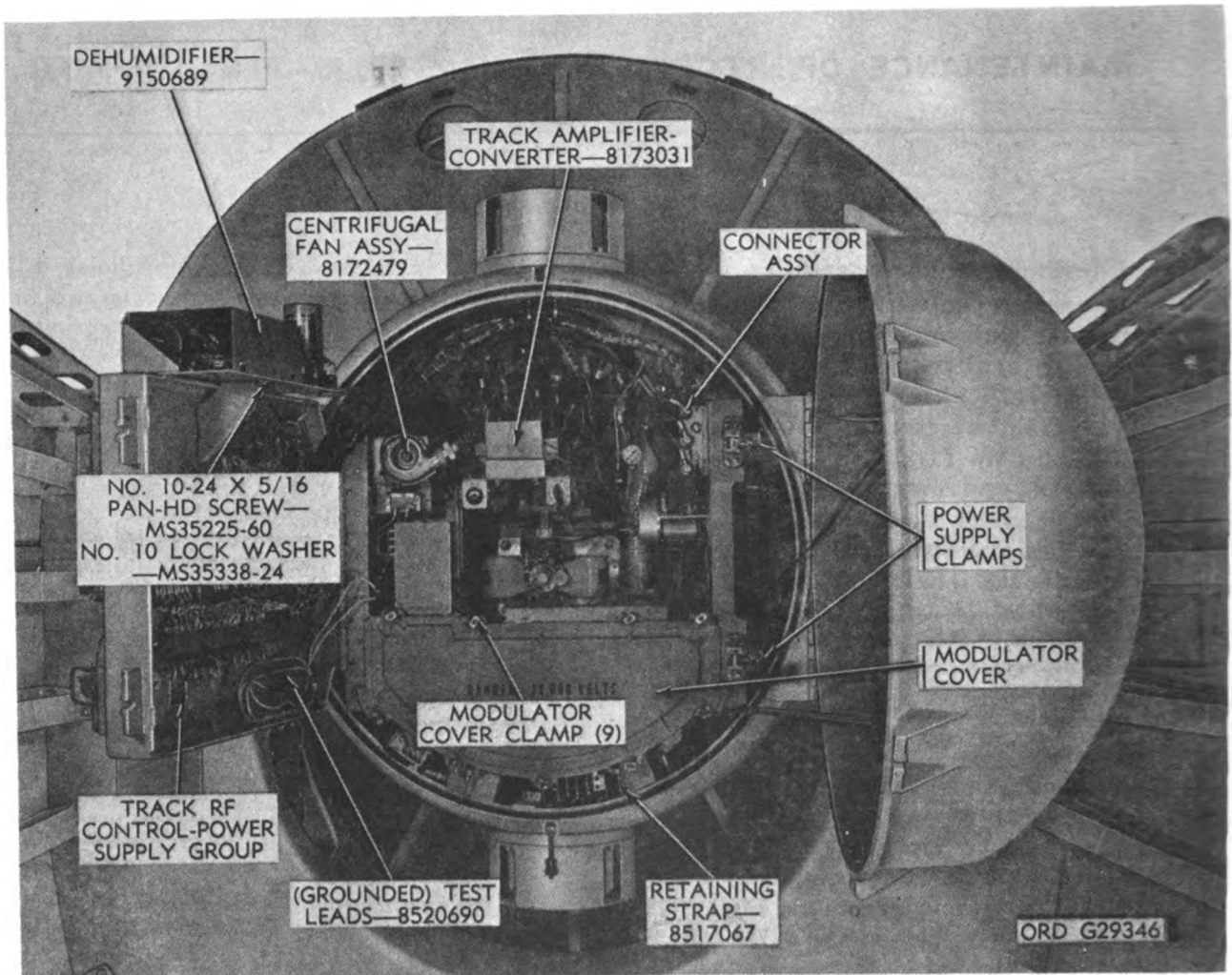
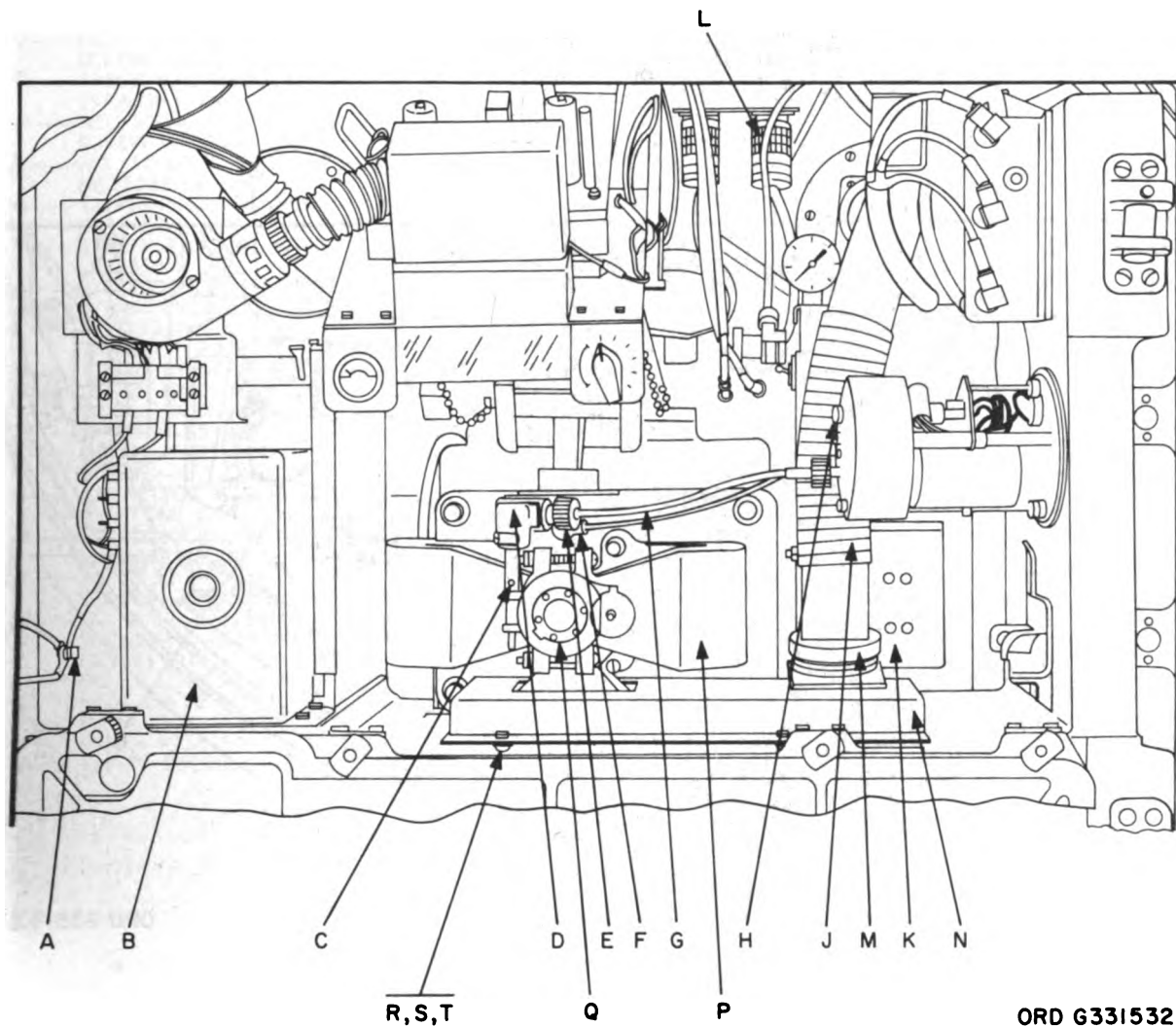


Figure 30. Missile-track receiver-transmitter—interior view.

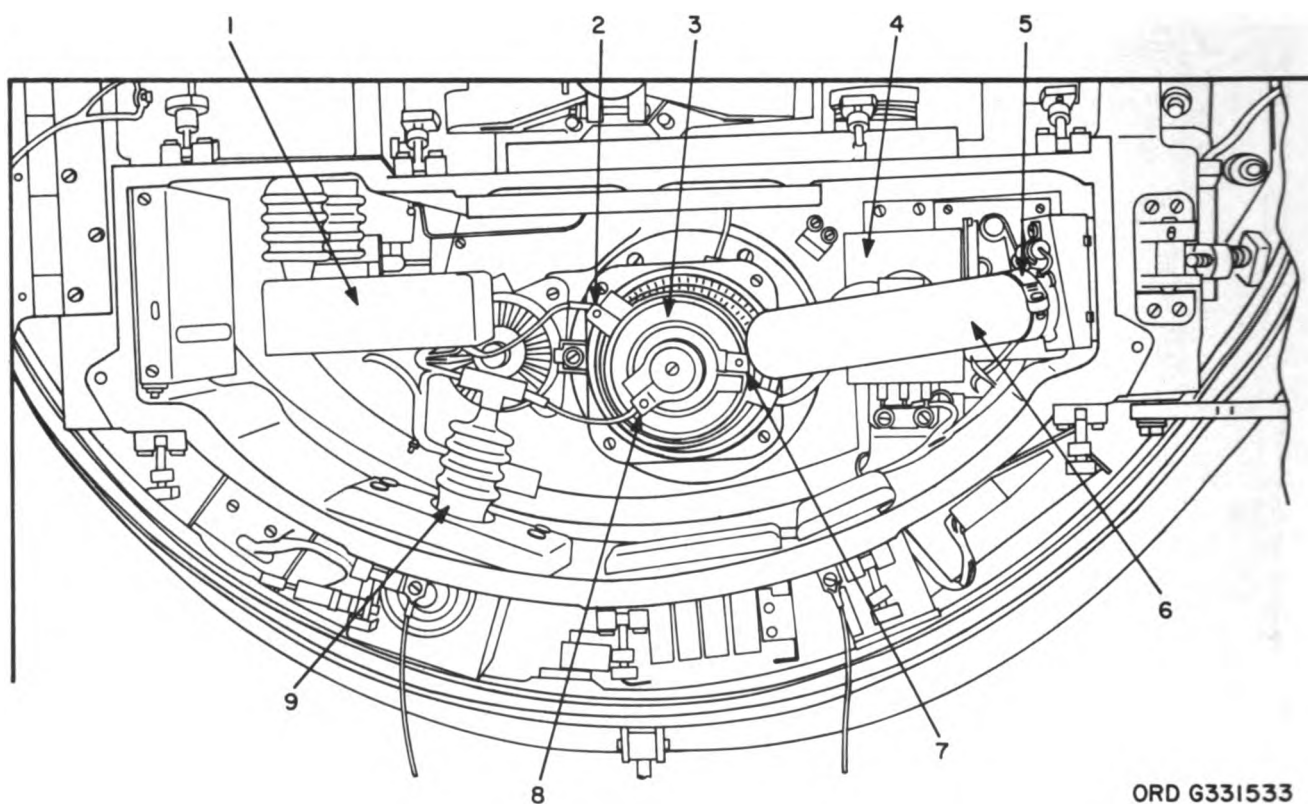


ORD G331532

A—Housing ground connection
 B—Capacitor (C9)
 C—No. 6-32 X 3/16 setscrew (2)
 D—Adapter
 E—Flexible shaft coupling
 F—Arc suppressor lead
 G—Flexible shaft
 H—Magnetron tuning drive dial
 J—Flexible hose

K—Pulse transformer (T5)
 L—Connectors P26 and J10
 M—Air duct assy coupling
 N—Air duct assy
 P—Magnetron electron tube
 Q—Magnetron dial
 R—No. 10-24 X 1/2 pan-hd screw (2)
 S—No. 10 lockwasher (2)
 T—0.218-in. flat washer (2)

Figure 31. Missile track receiver-transmitter—partial interior view no. 1.



ORD G331533

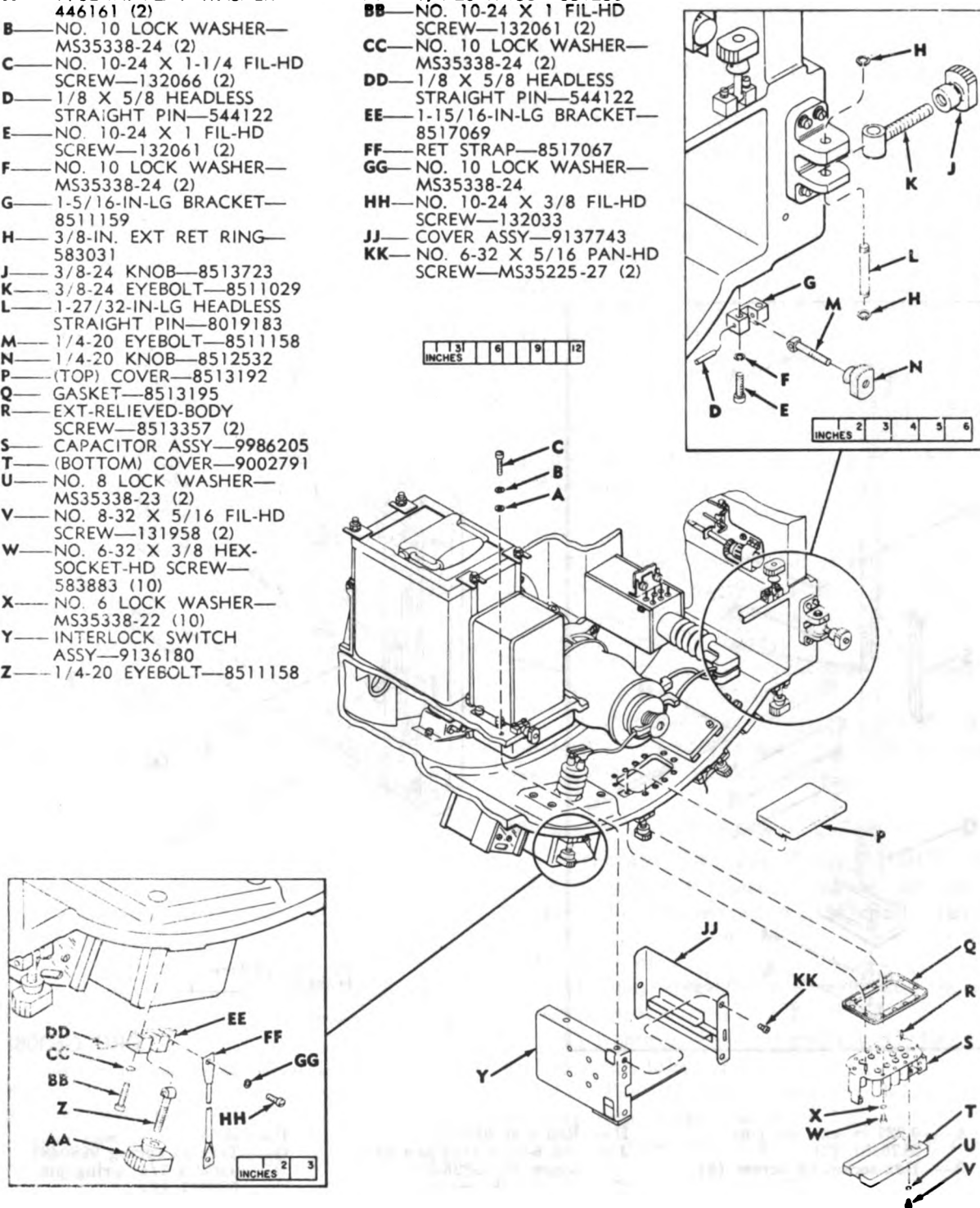
- 1—Electrical equipment chassis assy
- 2—Modulator cathode contact
- 3—Modulator electron tube V1
- 4—Transformer T3
- 5—Clamp

- 6—Air duct
- 7—Modulator filament contact
- 8—Modulator grid contact
- 9—Transformer T1

Figure 32. Target or missile track receiver-transmitter—partial interior view.

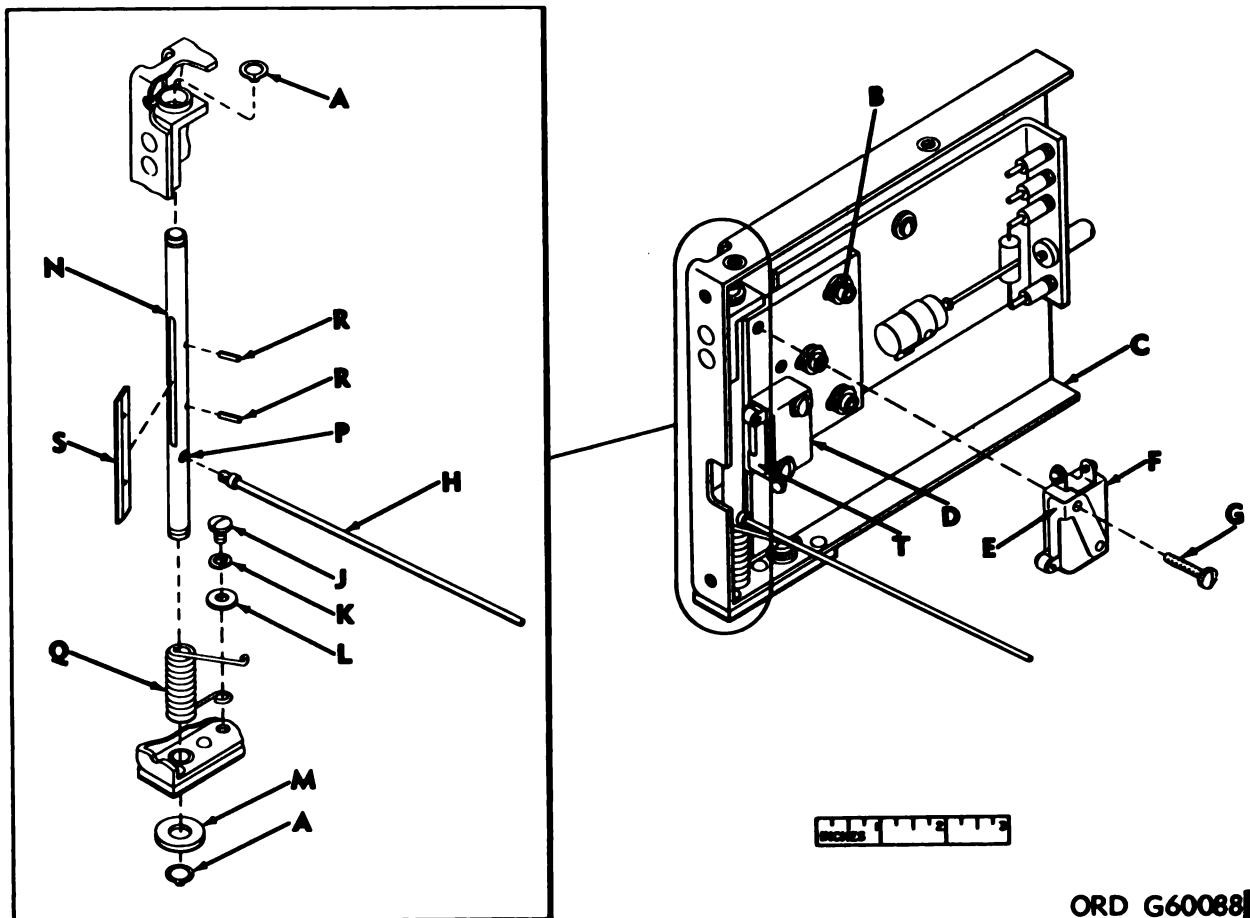
- A**—7/32-IN. FLAT WASHER—446161 (2)
B—NO. 10 LOCK WASHER—MS35338-24 (2)
C—NO. 10-24 X 1-1/4 FIL-HD SCREW—132066 (2)
D—1/8 X 5/8 HEADLESS STRAIGHT PIN—544122
E—NO. 10-24 X 1 FIL-HD SCREW—132061 (2)
F—NO. 10 LOCK WASHER—MS35338-24 (2)
G—1-5/16-IN-LG BRACKET—8511159
H—3/8-IN. EXT RET RING—583031
J—3/8-24 KNOB—8513723
K—3/8-24 EYEBOLT—8511029
L—1-27/32-IN-LG HEADLESS STRAIGHT PIN—8019183
M—1/4-20 EYEBOLT—8511158
N—1/4-20 KNOB—8512532
P—(TOP) COVER—8513192
Q—GASKET—8513195
R—EXT-RELIEVED-BODY SCREW—8513357 (2)
S—CAPACITOR ASSY—9986205
T—(BOTTOM) COVER—9002791
U—NO. 8 LOCK WASHER—MS35338-23 (2)
V—NO. 8-32 X 5/16 FIL-HD SCREW—131958 (2)
W—NO. 6-32 X 3/8 HEX-SOCKET-HD SCREW—583883 (10)
X—NO. 6 LOCK WASHER—MS35338-22 (10)
Y—INTERLOCK SWITCH ASSY—9136180
Z—1/4-20 EYEBOLT—8511158

- AA**—1/4-20 KNOB—8512532
BB—NO. 10-24 X 1 FIL-HD SCREW—132061 (2)
CC—NO. 10 LOCK WASHER—MS35338-24 (2)
DD—1/8 X 5/8 HEADLESS STRAIGHT PIN—544122
EE—1-15/16-IN-LG BRACKET—8517069
FF—RET STRAP—8517067
GG—NO. 10 LOCK WASHER—MS35338-24
HH—NO. 10-24 X 3/8 FIL-HD SCREW—132033
JJ—COVER ASSY—9137743
KK—NO. 6-32 X 5/16 PAN-HD SCREW—MS35225-27 (2)



ORD G60637

Figure 33. Radar modulator - partially exploded view No. 1.



ORD G60088

A—0.227-in. ext. ret ring
8175451 (2)
B—Hex-socket-hd screw (3)
C—Chassis assy 9136181
D—Switch (S4) 8518364
E—Switch actuator adapter
7602206
F—Switch (S3) 8518364
G—No. 4-40 x 9/16 bdg-hd
screw 583908 (4)

H—Rod assy 9137750
J—No. 6-32 x 3/16 pan-hd
screw MS35225-27
K—No. 6 lock washer
MS35338-22
L—0.156-in. flat washer
MS15795-206
M—1/4-in. flat washer
446188
N—Camshaft 9136188

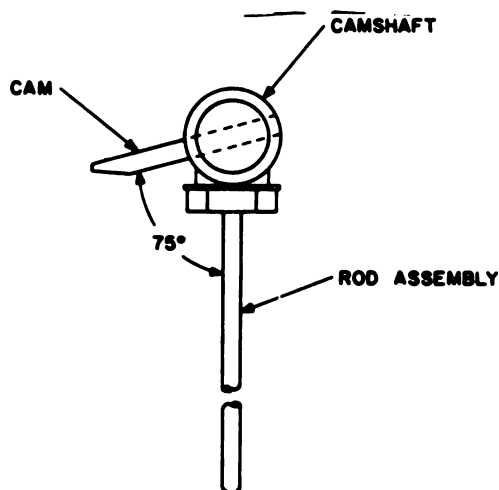
P—Hole
Q—Torsion spring 9980481
R—0.062 x 1/4 spring pin
589697 (2)
S—Cam 9136187
T—Switch actuator adapter
7602206

Figure 34. Interlock switch assembly 9136180—partially exploded view.

d. Installation.

(1) Install the interlock switch assembly in the reverse order of removal, *a* above.

(2) Perform the target-or missile-track transmitter checks in accordance with the track check procedures manual (para 3).



ORD G16796

Figure 35. Angular relationship of cam and rod assembly.

Figure 36. (Deleted)

37. Electrical Equipment Chassis Assembly

Warning: Voltages DANGEROUS TO LIFE exist in the modulator. Gain access to the modulator as specified in the procedures.

a. Removal.

(1) Gain access to the modulator in accordance with paragraph 11.11.3.

(2) Tag and disconnect the leads of electrical equipment chassis assembly (fig. 32) from modulator tube V1 and transformer T1.

(3) Remove knurled sleeve (T, fig. 44) and captive screw group (U) from electrical contact (Q).

(4) Remove corona shield (DD), and remove the electrical equipment chassis assembly.

Note. On electrical equipment chassis 9145851, the reference numbers for parts are different from those illustrated on figure 45, as follows:

Callout number	Reference number for electrical equipment chassis 9145851
A9	MS35267-15 (4-40 X 3/8 fil-hd)
A19	9145841
A20	9150400

b. Disassembly. Disassemble the electrical equipment chassis as indicated by figure 45. Tag all leads before disconnecting.

c. Assembly.

(1) Install R1 (A2), R2 (A16), and R3 (A14).

(2) Insert L2 (A19) into R13 (A20), and connect the leads of L2 to the terminals of R13.

(3) Install R13 and L2.

(4) Using copper wire (D), connect the upper terminal of R13 to the upper corona shield (A17) and the lower terminal of R13 to the lower corona shield.

(5) Connect the remaining leads in the electrical equipment chassis.

d. Installation.

(1) Install electrical equipment chassis assembly (R, fig. 44). Be sure bushing (W) is installed above RF cable assembly (EE) in corona shield (DD).

(2) Secure captive screw group (U), to electrical contact (Q).

(3) Connect white-red lead (C) and white-blue lead (B) to transformer T1 (fig. 32), and connect white-blue cable assembly (E, fig. 44) to modulator cathode contact (Fig. 32).

(4) Return the equipment to normal operation (para 11.11.3b).

(5) Perform the target-or missile-track transmitter checks in accordance with the track check procedure manual (para 3).

38. Electron Tube Socket XV2

Warning: Voltages DANGEROUS TO LIFE exist in the modulator. Gain access to the modulator as specified in the procedures.

a. Removal.

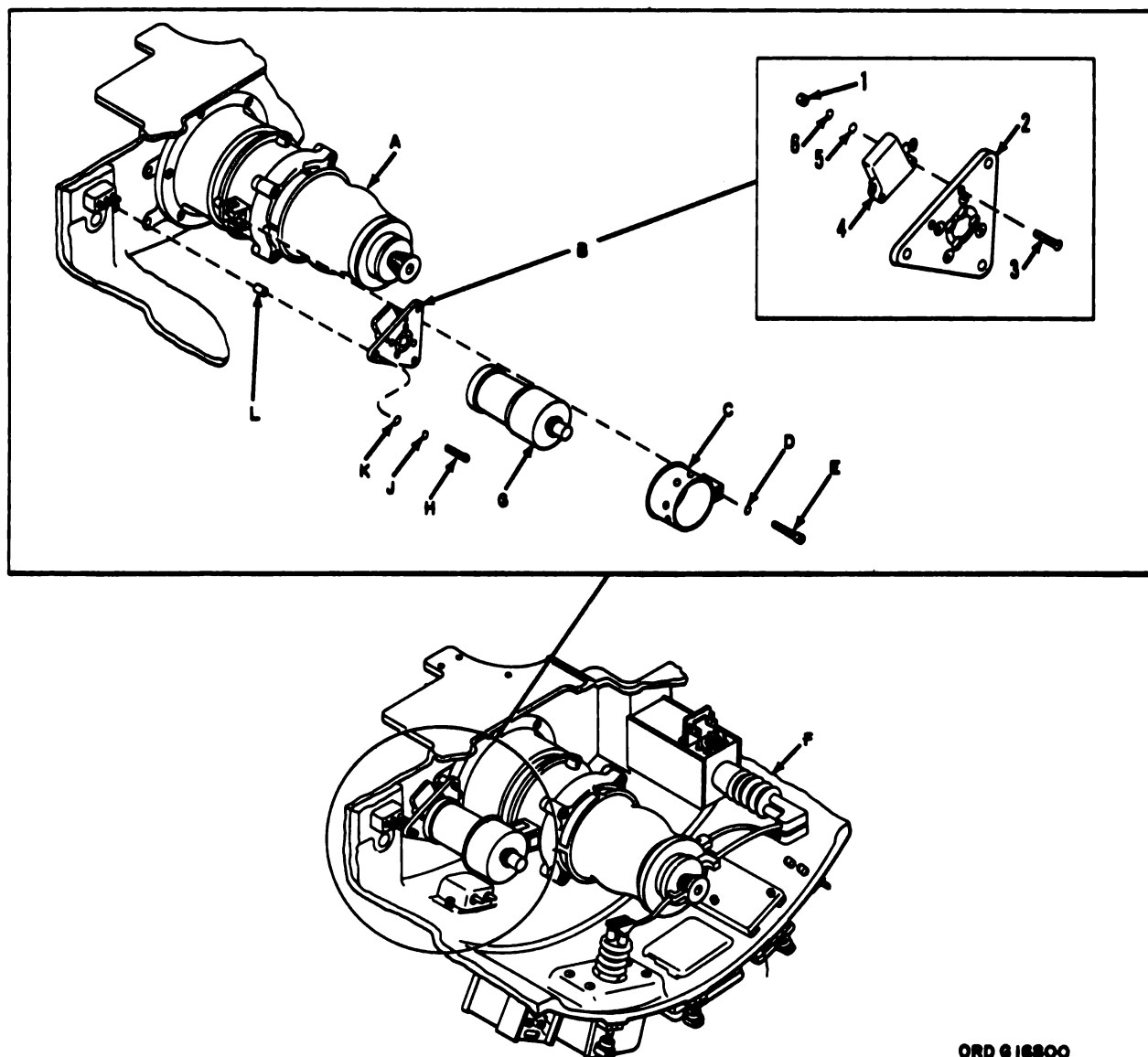
(1) Gain access to the modulator in accordance with para 11.11.3.

(2) Remove electrical contact (C, fig. 37) and electron tube V2 (G).

(3) Tag and disconnect the leads from electron tube socket assembly V2.

(4) Remove the socket assembly and three spacers.

b. Disassembly and assembly. Disassemble and assemble the tube socket assembly as indicated by B, figure 37.



ORD 616800

- A**—Electron tube (V1)
B—Electron tube socket assy (XV2)
 1—No. 4-40 hex nut (2)
 2—Electron tube socket
 3—No. 4-40 X 7/8 flat-hd screw (2)
 4—Capacitor (C14)
 5—1/8-in. flat washer (2)
 6—No. 4 lockwasher (2)
C—Electrical contact

- D**—1/4-in. lockwasher
E—1/4-20 X 2 fil-hd screw
F—Radar modulator housing
G—Electron tube (V2)
H—No. 10-24 X 1 1/2 fil-hd screw (3)
J—No. 10 lockwasher (3)
K—7/32-in. flat washer
L—3/4-in.-lg spacer (3)

Figure 37. Removal and installation of electron tube socket assembly (XV2) 8172361.

c. Installation.

(1) Connect the leads to electron tube socket assembly XV2 (B).

(2) Install electron tube socket assembly XV2.

(3) Install electron tube V2 (G) and electrical contact (C).

(4) Return the equipment to normal operation (para 11.11.3 b).

(5) Perform the target-track transmitter checks in accordance with the track check procedures manual (para 3).

39. Electron Tube Socket Assembly XV1

Warning: Voltages DANGEROUS TO LIFE exist in the modulator. Gain access to

the modulator as specified in the procedures.

a. Removal.

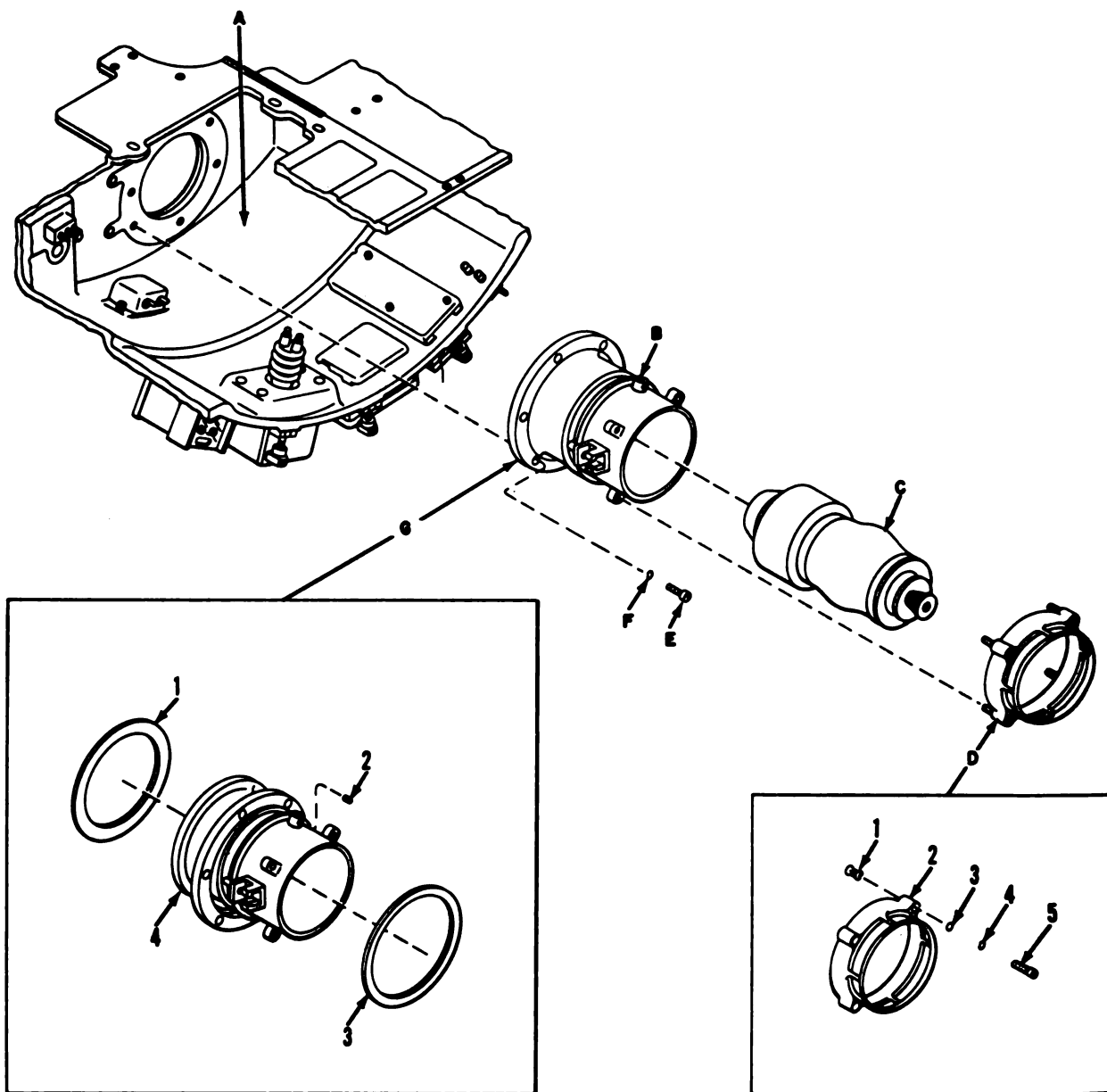
(1) Gain access to the modulator in accordance with para 11.11.3.

(2) Loosen the clamps, and remove the air duct.

(3) Disconnect the grid, filament, and cathode contacts from electron tube V1.

(4) Disconnect the lead from one side of the modulator cathode contact, and remove electrical contact (C, fig. 37).

(5) Loosen four fillister-head screws (D5, fig. 38); remove and disassemble electrical clamp assembly (D). Remove electron tube V1 (C).



ORD 6 16801

- A—Radar modulator housing
 B—Electrical connector—(p / o electron tube socket assy)
 C—(Modulator) electron tube (V1)
 D—Electrical clamp assy
 1—0.439-in-lg clip (4)
 2—Electrical clamp
 3—7 / 32-in. flat washer (4)
 4—No. 10 lockwasher (4)

- 5—No. 10-24 X 1 fil-hd screw (4)
 E—1/4-20 X 3/4 fil-hd screw (6)
 F—1/4-in. lockwasher (6)
 G—(Modulator) electron tube socket assy
 1—5 1/8-in-id gasket
 2—No. 8-32 X 3 / 16 hex-socket setscrew
 3—6-in-id gasket
 4—Electron tube socket group

Figure 38. Removal and installation of modulator electron tube socket assembly XVI.

(6) Loosen two setscrews (G2), and remove the lead from electrical connector (B).

(7) Remove six fillister-head screws (E), and remove the electron tube socket assembly (G).

b. Disassembly and assembly.

(1) Remove gaskets (G1, and G3) from the electron tube socket assembly.

(2) Cement new 6-inch-id gasket (G3) and new 5½-inch-id gasket (G1) to electron tube socket group with synthetic rubber-to-steel adhesive 52C1567-50.

c. Installation.

(1) Install the tube socket in the reverse order of removal, *a* above.

(2) Perform the track-radar-system transmitter checks in accordance with the track check procedures manual (para 3).

40. Capacitor C9

Warning: Voltages DANGEROUS TO LIFE exist in the modulator. Gain access to the modulator as specified in the procedures.

a. Removal.

(1) Gain access to the modulator in accordance with 11.11.3.

(2) Tag the leads; disconnect, and remove centrifugal fan assembly (fig. 30).

(3) Remove corona shield (DD, fig. 44) and knurled sleeve (T).

(4) Loosen captive screw group (U), and remove electrical equipment chassis assembly (R), with remaining leads connected, from the -500v bias power supply (M) and capacitor C9 (E).

(5) Disconnect leads from -500v bias power supply (M), and remove the power supply. Remove gasket (N).

(6) Remove hexagon-cap nut (Y) and associated hardware, and disconnect bus bar (FF) and leads from capacitor C9 (E).

(7) Remove capacitor cover (D), capacitor C9, and gaskets (F and BB).

(8) Remove eyebolts (CC and G).

b. Installation.

(1) Install two 5½-inch-long eyebolts (CC), fig. 44 and two 9½-inch-long eyebolts (G).

(2) Place new 4.490-inch-od gasket (F) and 1.660-inch-od gasket (BB) in the grooves on radar modulator housing (X).

(3) Install capacitor C9 (E).

(4) Connect leads and bus bar (FF) to

terminal 2 of capacitor C9. Secure leads with 7 / 32-inch flat washer (AA), no. 10 lockwasher (Z), and no. 10-32 hexagon-capnut (Y).

(5) Place new 2.252-inch-od gasket (N) in groove on radar modulator housing (X).

(6) Install the -500v bias power supply (M).

(7) Install electrical equipment chassis assembly (R). Be sure bushing (w) is installed above RF cable assembly (EE) in corona shield (DD). Check that terminal lugs inside electrical equipment chassis are connected to correct terminals of capacitor C9 (E) and -500v bias power supply.

(8) Secure captive screw group (U) to 1½-inch-long electrical contact (Q).

(9) Connect the leads to the -500 v bias power supply.

(10) Install the centrifugal fan assembly.

(11) Connect leads to centrifugal fan assembly (fig. 30).

(12) Return the equipment to normal operation (para 11.11.3 b).

(13) Perform the radar-system transmitter checks in accordance with the track check procedures manual (para 3).

41. Capacitor Assembly

Warning: Voltages DANGEROUS TO LIFE exist in the modulator. Gain access to the modulator as specified in the procedure.

a. Removal.

(1) Gain access to the modulator in accordance with para 11.11.3.

(2) Remove the covers (P and T, fig. 33) from the capacitor assembly.

(3) Tag and disconnect the leads, and remove the capacitor assembly (S).

b. Installation.

Note. Use a new gasket (Q) when installing the capacitor assembly.

(1) Install the capacitor assembly in the reverse order of removal, *a* above.

(2) Perform the radar system transmitter checks in accordance with the track-check procedures manual (para 3).

42. Knobs

Warning: Voltages DANGEROUS TO LIFE exist in the modulator. Gain access to the modulator as specified in the procedure.

a. Removal.

(1) Gain access to the modulator in accordance with paragraph 11.11.3.

Note. Step (2) below applies to knob 8512532.

(2) Remove bracket (EE or G, fig. 33).

(3) Remove eyebolt (K, M, or Z) with knob (J, N, or AA) attached.

b. Installation.

(1) Install the knob on the eyebolt and stake

the first two threads.

(2) Install the eyebolt with attached knob in the bracket.

Note. Step (3) below applies to knob 8512532.

(3) Install the bracket (G, or EE) on the chassis.

(4) Return the equipment to normal operation (para 11.11.3 b).

Section 11. RECEIVER-TRANSMITTER RADAR SUBASSEMBLY— TRANSMITTER PORTION

Warning: The track receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Gain access to the unit as specified in the procedures.

Caution: The magnetron electron tube contains a strong magnet. Keep meters, watches, tools, and similar metallic objects at least 3 feet from the tube to prevent damage.

Note. Paragraph 43 applies to all MTR's and to TTR's in basic systems.

43. Pulse Transformer T5

a. Removal.

(1) Gain access to the rear of the receiver-transmitter as specified in para 11.11.3.

(2) Unscrew flexible shaft coupling (E, fig. 31) from adapter (D), and disconnect flexible shaft (G) from the adapter.

(3) Loosen two setscrews (C) securing the adapter to magnetron electron tube (P); pull the adapter upward; and remove.

(4) Unscrew air duct assembly coupling (M) from air duct assembly (N). Remove two panhead screws, lockwashers, and flat washers (R, S, and T); remove the air duct assembly.

(5) Disconnect arc suppressor lead (F) from the magnetron electron tube.

(6) Move the end of flexible hose (J) away

from pulse transformer (K).

(7) Remove four sleeve nuts (K, fig. 39).

Caution: Exercise care to prevent jarring or dropping magnetron electron tube.

(8) Remove magnetron electron tube (J) in accordance with the operator and organizational maintenance manual (para 3).

(9) Remove RF shielding (M).

(10) Remove magnetron mounting plate (G) from duplexer support (A).

(11) Loosen setscrews (B), and remove lead (Q) or bus bar (H) from pulse transformer group (E).

(12) Disconnect the external leads from capacitor assembly (P) as required to permit removal of the pulse transformer group from duplexer support (A).

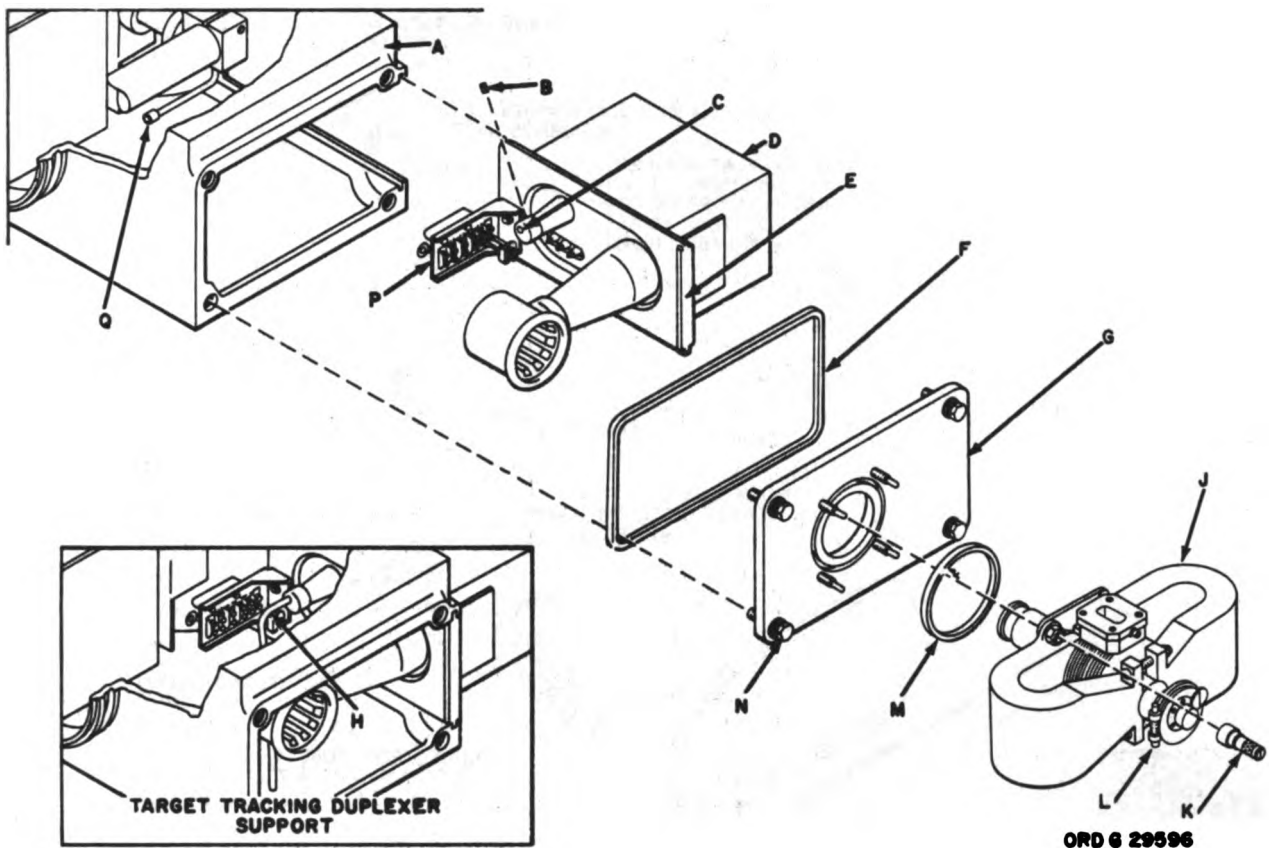
(13) Pull the pulse transformer group forward, and remove from the duplexer support.

(14) Disconnect and tag the transformer lead (fig. 40) from the electron tube coupler.

(15) Loosen three setscrews, and remove electron tube coupler from pulse transformer T5.

(16) Disconnect and tag the remaining leads from pulse transformer T5.

(17) Remove pulse transformer T5 from the transformer mounting plate.



A—Missile tracking duplexer support
 B—No. 6-32 X 3/16 setscrew (2)
 C—Terminal 2
 D—Pulse transformer (T5)
 E—Pulse transformer group
 F—Gasket shielding
 G—Magnetron mounting plate
 H—Bus bar

J—Magnetron electron tube
 K—Sleeve nut (4)
 L—Shaft
 M—RF shielding
 N—Captive bolt (4)
 P—Capacitor assy
 Q—Lead

Figure 39. Removal and installation of pulse transformer group.

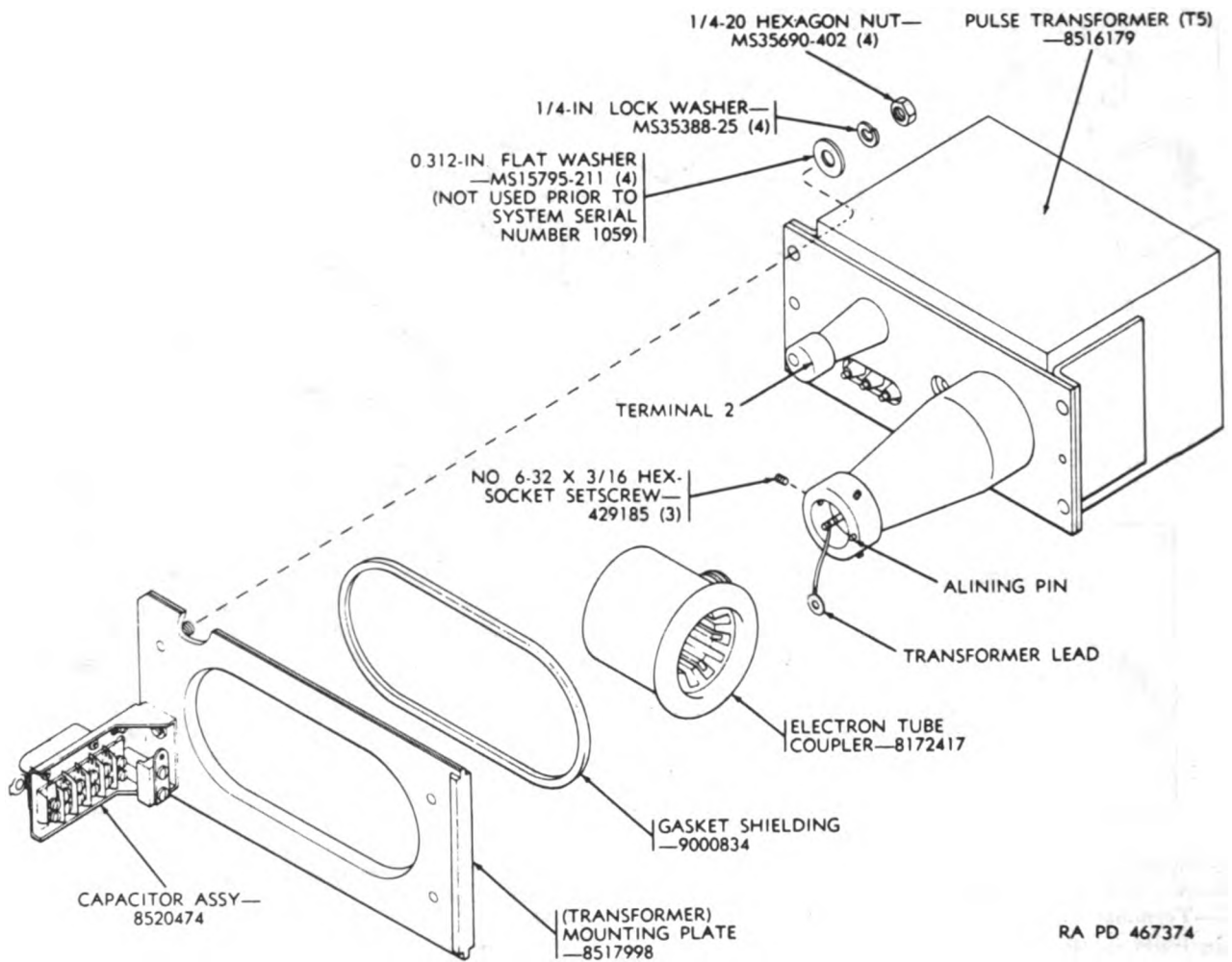


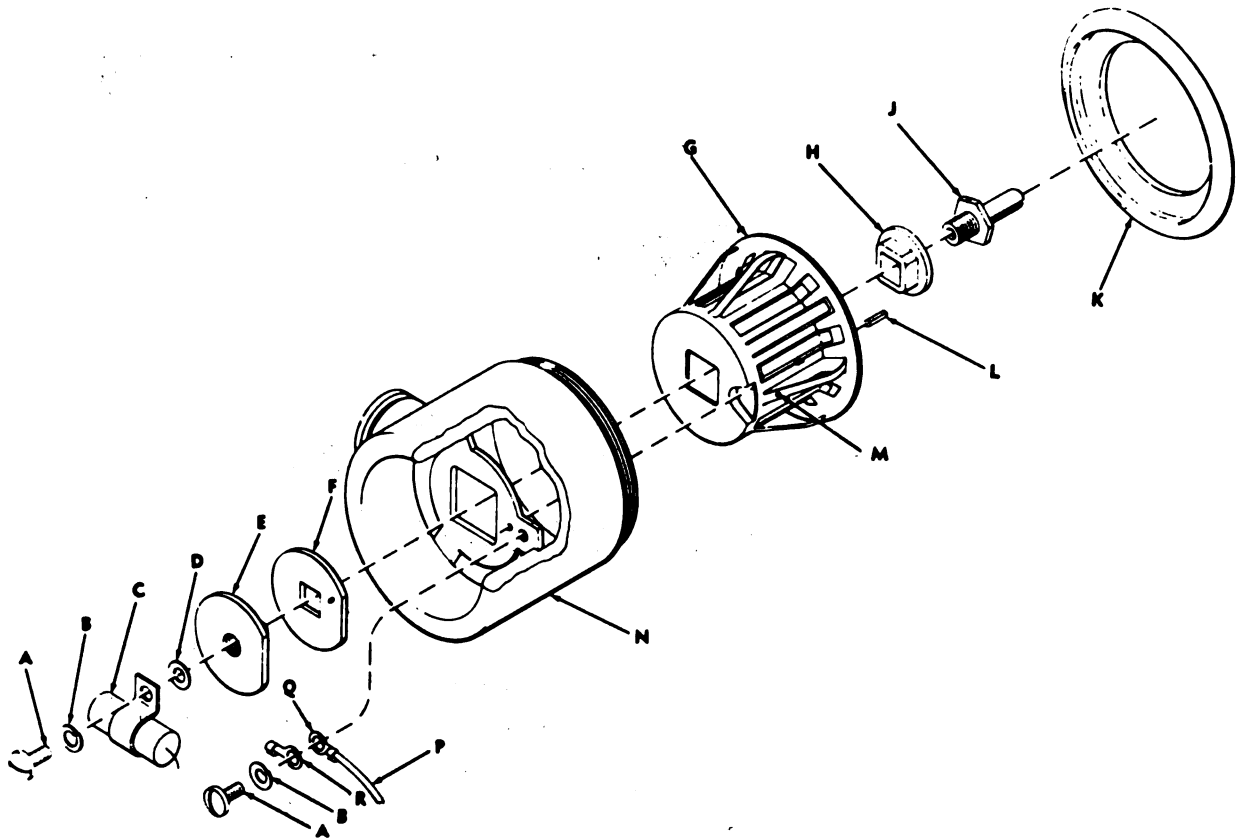
Figure 40. Pulse transformer—exploded view.

b. Disassembly.

(1) Remove two binding-head screws (A, fig. 41) and associated hardware; remove C13 (C).

(2) Unscrew retaining ring (K) from outer electrical contact (N).

(3) Unscrew center electrical contact (J) from electrical contact (E), and complete disassembly of electron tube coupler.



RA PD 467375

- | | |
|---|-------------------------------------|
| A—No. 6-32 X $\frac{1}{4}$ bdg-hd screw | F— $1\frac{1}{8}$ -in-dia insulator |
| B—No. 6 lockwasher | G—Silver-plated contact |
| C—Capacitor (C13) | H— $\frac{1}{4}$ -in-dia insulator |
| D— $\frac{5}{32}$ -in. flat washer | J—(Center) electrical contact |
| E— $1\frac{1}{16}$ -in-dia electrical contact | K—Retn ring |

- | |
|------------------------------------|
| L—0.062 X $\frac{1}{4}$ spring pin |
| M—0.055-in-dia hole |
| N—(Outer) electrical contact |
| P—Wire braid |
| Q—Terminal lug |
| R—Terminal lug |

Figure 41. Electron tube coupler 8172417—exploded view.

c. Assembly.

(1) Drive spring pin (L) into outer electrical contact (N) until one-half of pin length extends into the contact.

(2) Insert an end of wire braid (P) through 0.055-inch hole (M) in inner electrical contact (G), and solder the braid to the contact.

(3) Insert inner electrical contact (G) into outer electrical contact (N), and rotate until the base of the outer electrical contact clears the spring pin (L). Connect the lead of capacitor (C) to the terminal lug (R).

Note. The straight edges on the contact (E) and insulator (F) must be adjacent to the spring pin.

(4) Using sealing compound MIL-S-7124 on the threads of electrical contact (N), reassemble the electron tube coupler (fig. 41).

d. Installation.

Note. If the gasket shielding (F, fig. 39) is frayed or damaged, cut a piece of gasket shielding $1/8$ to $3/16$ inch larger than the groove length in magnetron mounting plate (G). Intermesh the loose ends of the gasket shielding to form a continuous gasket, and assemble in the groove of the magnetron mounting plate.

(1) Install the pulse transformer in the reverse order of removal, as above. Adjust the flexible shaft (G) as indicated in (2) below.

(2) Manually rotate flexible shaft (G) until the magnetron tuning drive dial (H) and

magnetron dial (Q) have identical indications. Connect and secure the flexible shaft to the adapter with flexible shaft coupling (E).

(3) Return the equipment to normal operation (para 11.11.3).

(4) Perform the track radar transmitter checks in accordance with the track check procedures manual (para 3).

Note. Paragraph 44 applies only to TTR's in Improved and ATBM systems.

44. Pulse Transformer

Warning: The track receiver-transmitter contains voltages DANGEROUS TO LIFE. Gain access as specified in the procedures.

Caution: The magnetron electron tube contains a strong magnet. Keep meters, watches, tools, and similar metallic objects at least 3 feet from the tube to prevent damage.

a. Removal.

(1) Gain access to the modulator as specified in paragraph 11.11.3.

(2) Perform the procedures of para 43 a (2) through (8).

(3) Inspect RF shielding (3, fig. 42); remove if damaged.

(4) Remove three setscrews (8 and 9), and disconnect and tag electron tube coupler leads

(10) from transmitter assembly.

(5) Loosen setscrew (12), and disconnect bus bar (13) from terminal board assembly (14).

(6) Remove five setscrews (15, 16, and 17, fig. 42). Disconnect and tag the leads from the pulse transformer terminals (19 and 21).

(7) Disconnect and tag the external leads from terminal board assembly (14).

(8) Remove bus bar (18) from socket assembly (23). Pull the pulse transformer group forward, and remove from the duplexer support.

(9) Disconnect transformer lead (1, fig. 43) from electron tube coupler (2).

(10) Loosen three setscrews (3), and remove electron tube coupler from pulse transformer T5 (4).

(11) Disconnect and tag the remaining leads from T5.

(12) Remove T5 from mounting plate (8).

(13) Inspect gasket shielding (9); remove if necessary.

b. Disassembly and Assembly.

Note. Capacitor (C, fig. 40) does not exist in this electron tube coupler. An electrical lead is connected at the same point as this capacitor.

Disassemble and assemble the electron tube coupler in accordance with paragraphs 43b and c.

KEY to fig. 42:

- 1—Sleeve nut (4)
- 2—Magnetron electron tube
- 3—RF shielding
- 4—Captive bolt (4)
- 5—Magnetron mounting plate group
- 6—Duplexer support
- 7—Gasket shielding
- 8—No. 8-32 x 1/8 setscrew
- 9—No. 8-32 x 1/8 setscrew (2)
- 10—Electron tube coupler leads (2)
- 11—Transmitter subassy
- 12—No. 6-32 X 3/16 setscrew
- 13—Bus bar
- 14—Terminal board assy
- 15—No. 8-32 X 3/16 setscrew (2)
- 16—No. 6-32 X 3/16 setscrew (2)
- 17—No. 6-32 X 3/16 setscrew (2)
- 18—Bus bar
- 19—Terminal 2
- 20—White lead
- 21—Terminal 7
- 22—Pulse transformer group
- 23—Socket assy

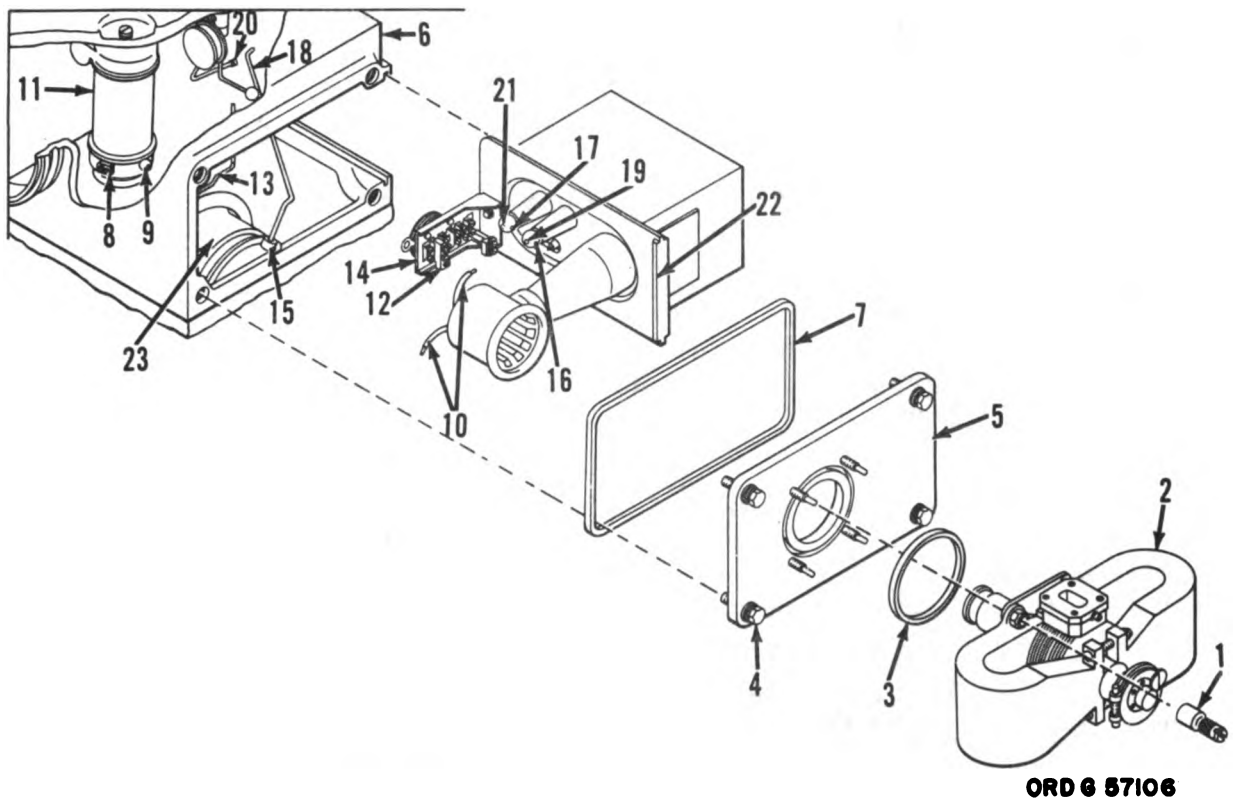


Figure 42. Removal and installation of pulse transformer group.

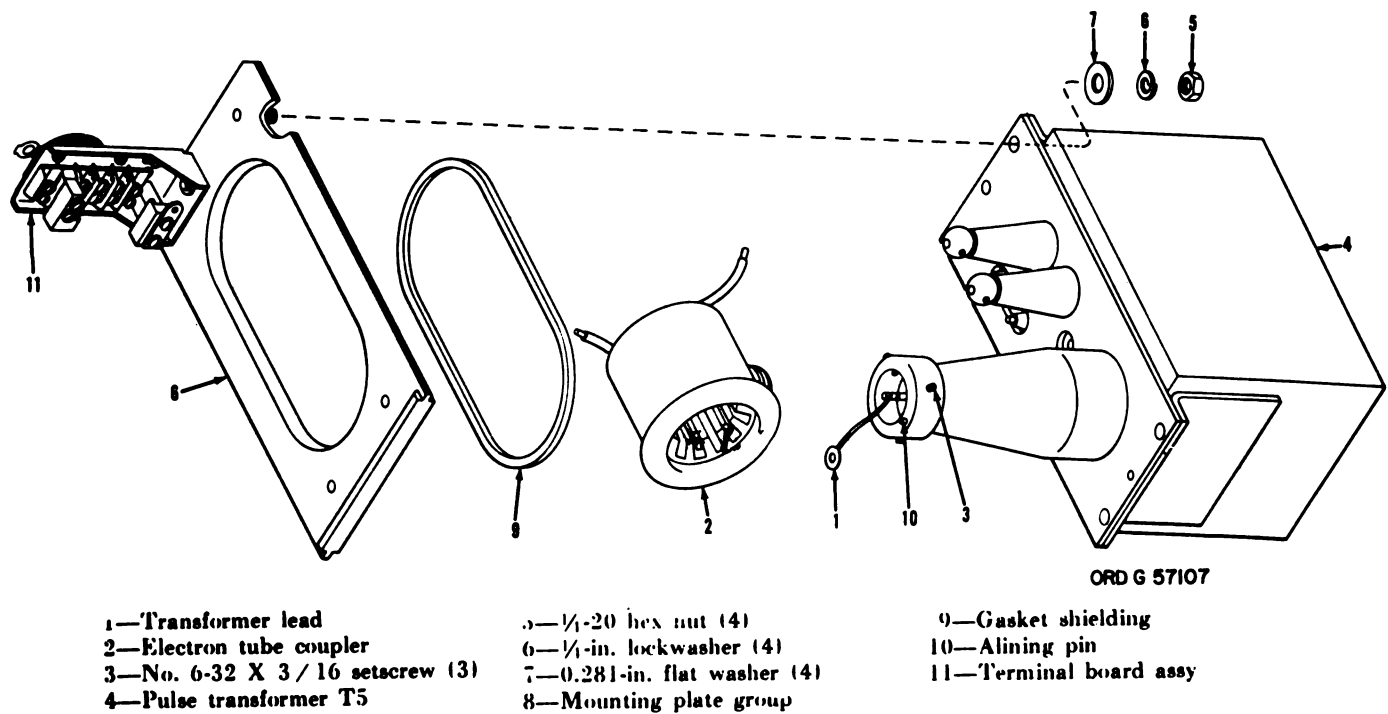


Figure 43. Removal and installation of pulse transformer T5.

c. Installation.

Note. If new shielding gaskets are required (3 or 7, fig. 42), cut a new gasket from gasket shielding which is 1/8 to 3/16 inch larger than the gasket groove. Intermesh the loose ends of the gasket shielding to form a continuous gasket.

Replace the transformer in the reverse order of removal, *a* above. Refer to para 43 d (2) for instructions on installation of the flexible shaft.

45-51. (Deleted)

Section III. MONOPULSE DUPLEXERS

Warning: The track receiver-transmitter contains voltages DANGEROUS TO LIFE. Turn TARGET POWER switch or MISSILE POWER switch, as applicable, on the radar power control panel to off position. Discharge capacitors C9, C11, C12, C15, C18, and C19.

Caution: The magnetron electron tube contains a strong magnet. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron electron tube to prevent damage.

Note. Procedures in paragraphs 51.1 and 51.2 below are applicable to either the MTR or TTR.

51.1 Removal of Monopulse Duplexer

a. Set the ANTENNA switch to DISABLE. Remove track radome and track antenna reflector in accordance with the assembly and emplacement procedures manual (para 3).

Caution: The receiver-transmitter is unbalanced with the reflector removed. Use sufficient personnel when changing the elevation angle.

b. Disengage the elevation lock (fig. 29), and position the receiver-transmitter to 0 mils elevation. Engage the elevation lock.

c. Disengage the azimuth transit lock (fig. 29), and rotate the antenna pedestal to the most convenient position for working on the front and

rear of the receiver-transmitter. Engage the azimuth transit lock.

d. Remove four socket-head screws (1, fig. 43.1).

e. Remove two hexagon nuts (6), lock washers (7), and flat washers (8).

f. Remove two socket-head screws (9) and flat washers (8).

g. Carefully remove braces (11 and 13).

h. Remove grooved coupling clamp (4), and disengage bellows (5) from monopulse duplexer housing (10).

i. Disconnect and tag rear hose assembly (1, fig. 43.2), front hose assembly (2), and bottom hose assembly (3) from monopulse duplexer (6).

j. Loosen two screws (5) holding stop block (4).

k. Release four clamps (fig. 29), and open the cover.

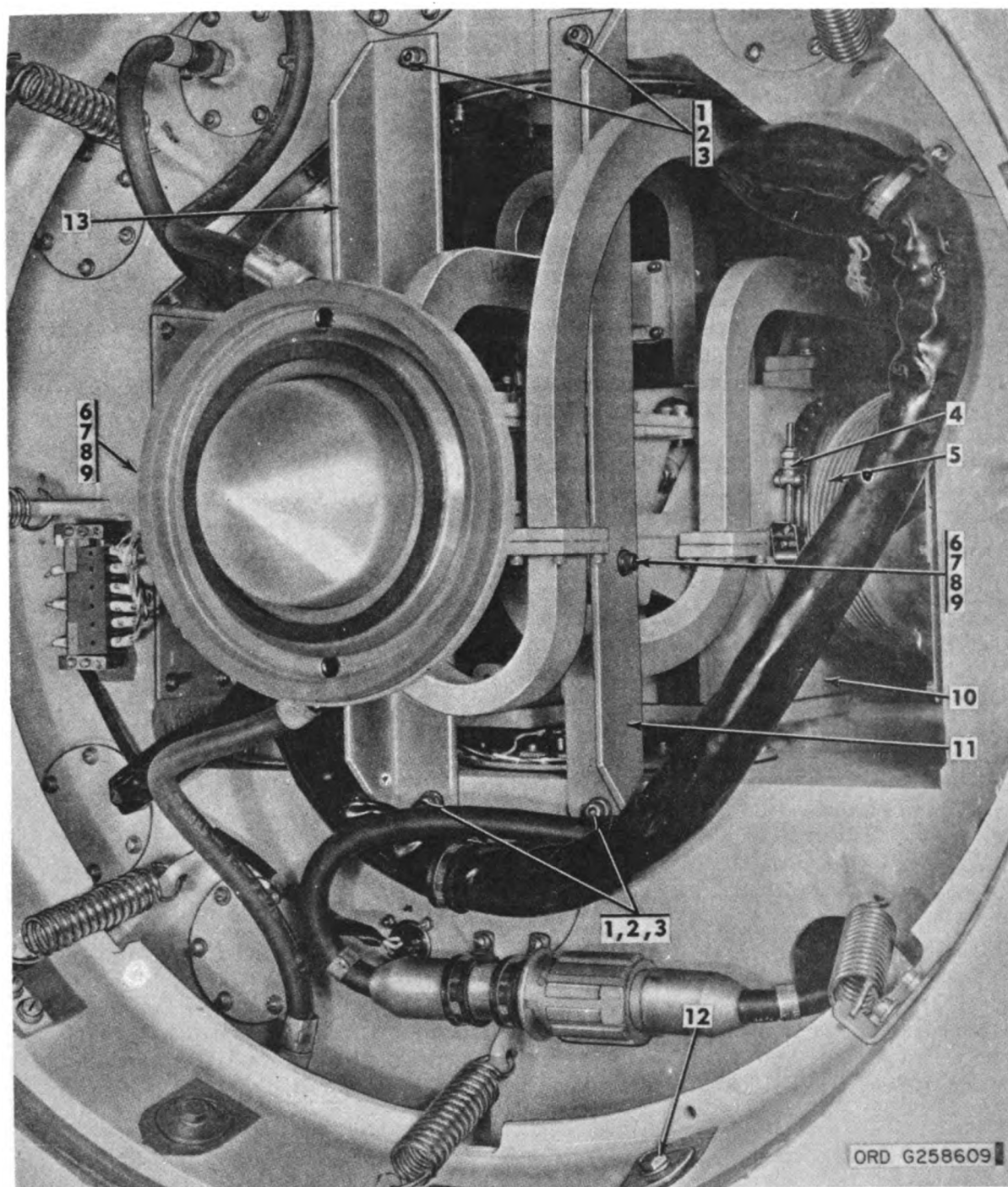
l. Release two power supply clamps, and open track RF control-power supply group to the position shown in figure 30.

Warning: Voltages DANGEROUS TO LIFE exist in the modulator. Use the grounded test leads (fig. 30) to discharge capacitors after performing *m* below.

m. Release nine modulator cover clamps (fig. 30), and remove modulator cover.

n. Remove the pressurization unit (para 53).

o. Remove pulse transformer group (para 43 or 44).

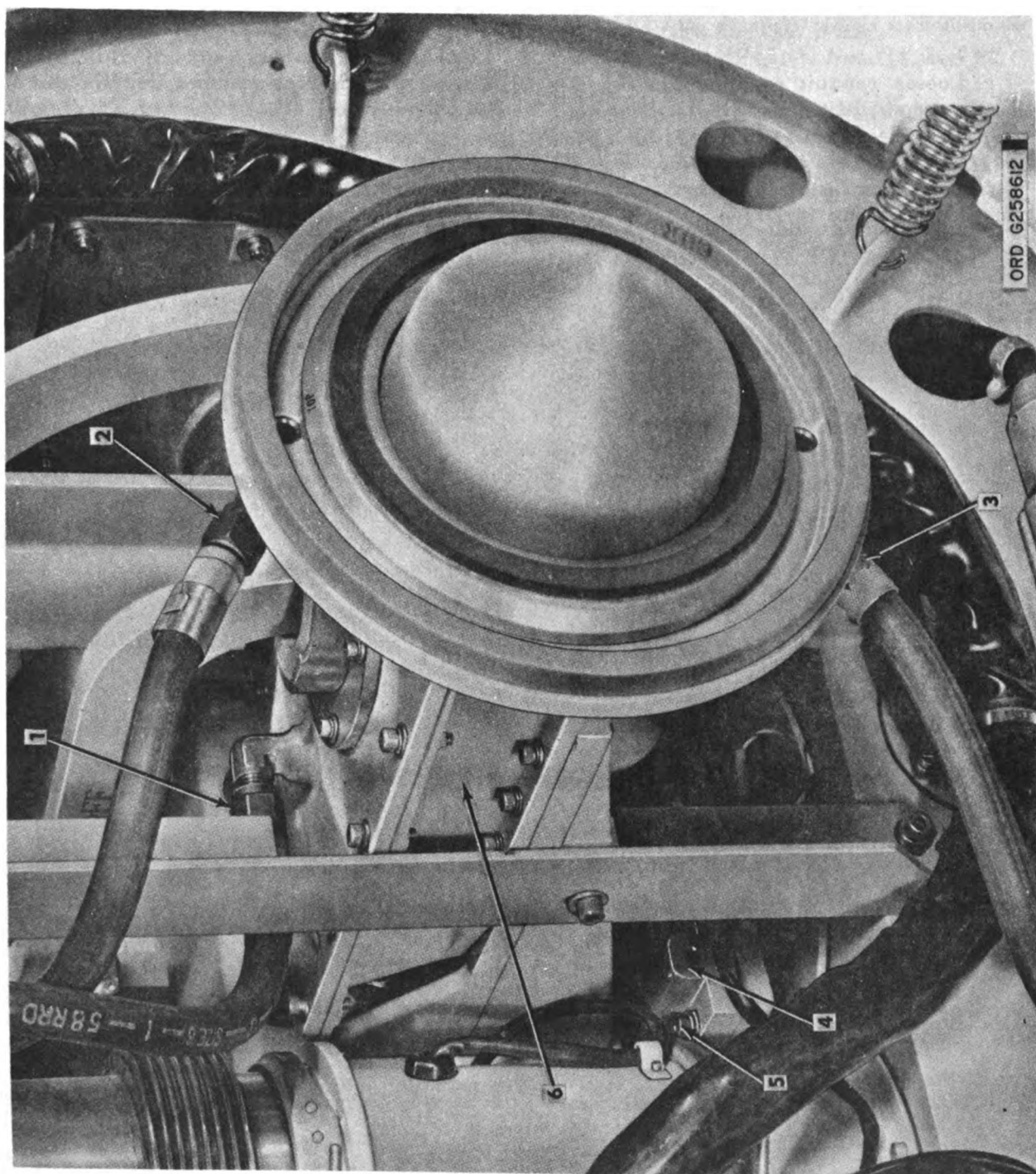


1— $\frac{1}{4}$ -20 X 1 socket-hd screw (4)
 2— $\frac{1}{4}$ -in. lockwasher (4)
 3— $\frac{13}{32}$ -in. fl washer (4)
 4—Grooved coupling clamp

5—Bellows
 6—No. 6-32 hex nut (2)
 7— $\frac{1}{4}$ -in. lockwasher (2)
 8— $\frac{13}{32}$ -in. fl washer (4)

9— $\frac{1}{4}$ -20 X $1\frac{1}{4}$ socket-hd screw (2)
 10—Monopulse duplexer housing
 11—Brace 8158897
 12—Hex-hd screw (8)
 13—Brace 8158896

Figure 43.1. Target-or missile-track receiver-transmitter—right-front view.



- 1—Rear hose assy
- 2—Front hose assy
- 3—Bottom hose assy

- 4—Stop block
- 5—No. 10-24 x 7/8 hex-socket-hd screw
- 6—Monopulse duplexer

Figure 43.2. Target-or missile-track receiver-transmitter—left-front view.

Note. The procedures in *p* through *u* below apply to the missile-track receiver-transmitter only.

p. Loosen conduit coupling (1, fig. 43.3), disconnect air duct hose (2).

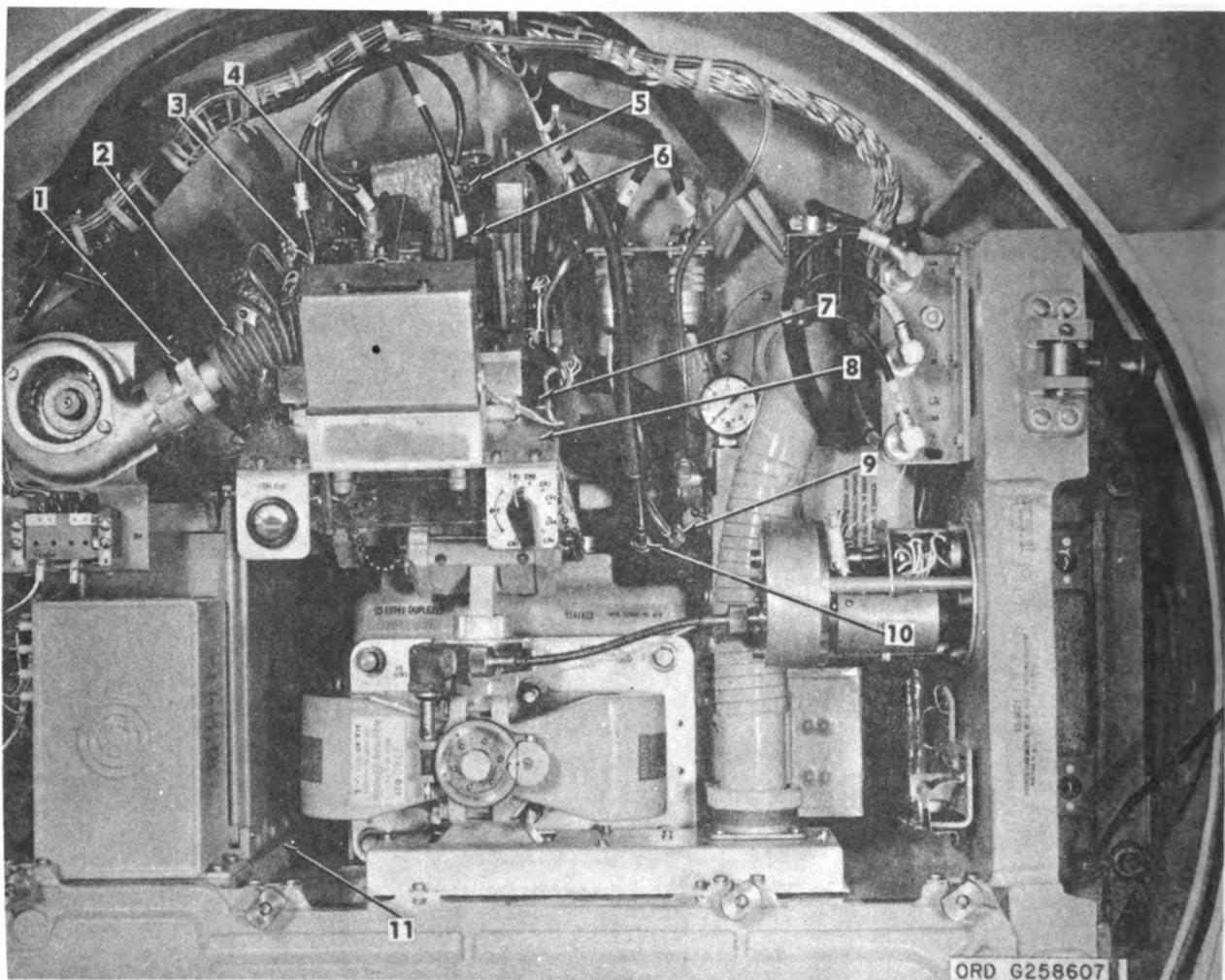
q. Disconnect connectors P7 (3) from J2, P6, (4) from J2, P4 (5) from J3, and P5 (6) from J2.

r. Loosen four fasteners (7), and remove track amplifier-converter (8).

s. Disconnect connectors P12 (9) from J1, and P11 (10) from J2.

t. Disconnect and tag lead clips (9, 10, and 11, fig. 43.4) from electron tubes V5, V6, and V7, respectively.

u. Remove connector J8 (3) and attached wiring harness (4). Remove connector J7 (7) and attached wiring harness (8) from monopulse duplexer (20).



1—Conduit coupling
2—Air duct hose
3—Connectors P7 and J2
4—Connector P6 and J2

5—Connectors P4 and J3
6—Connectors P5 and J3
7—Fastener (4)
8—Track amplifier-converter

9—Connectors P12 and J1
10—Connectors P11 and J2
11—Raised flange

Figure 43.3. Missile-track receiver-transmitter—interior view.

Note. The procedures in *u.1* through *u.5* below apply to the target-track receiver-transmitter only.

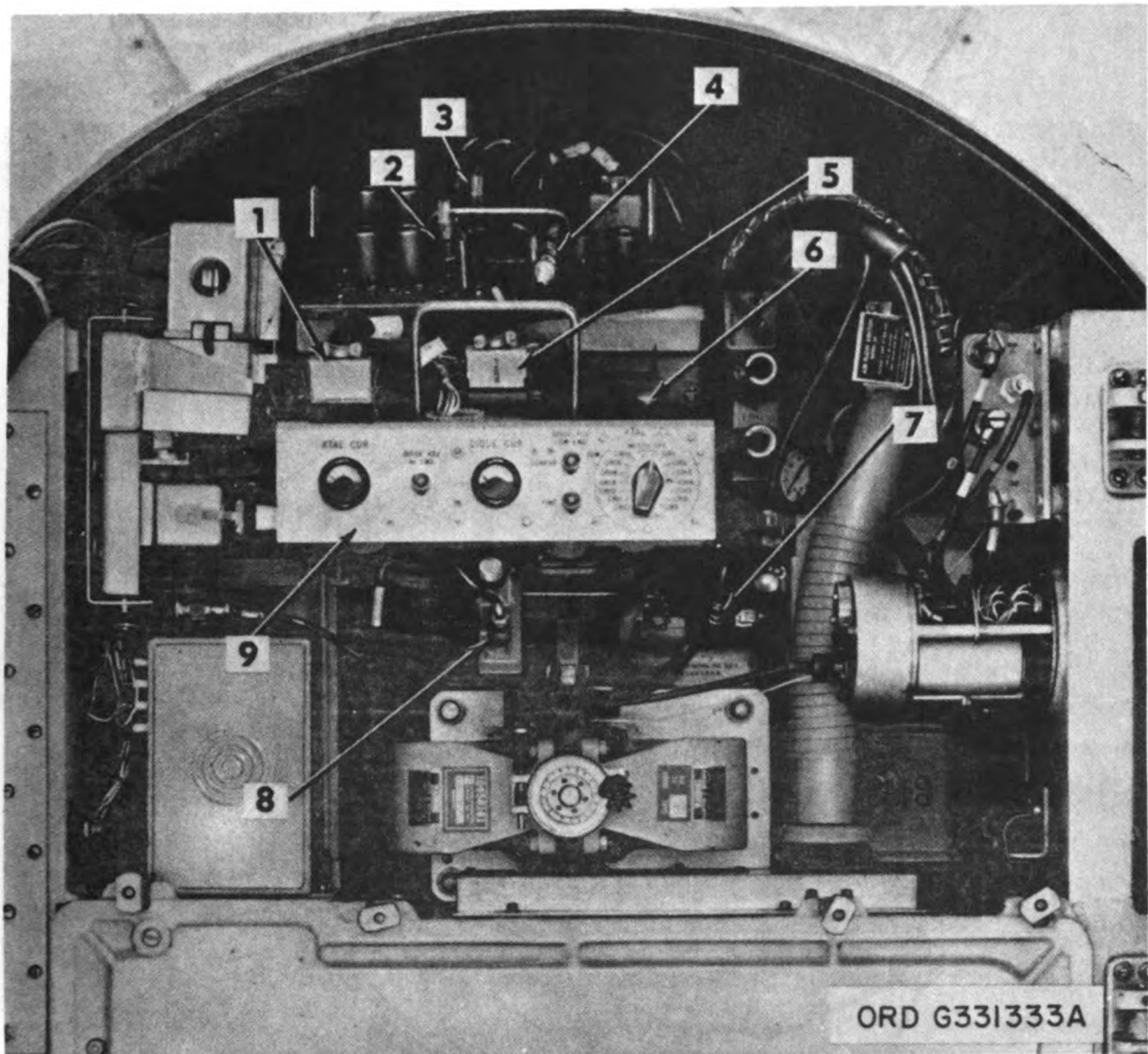
u.1. Disconnect connectors P5 (4, fig. 43.3.1) from the T connector on J2 of the sum IF preamplifier; P6 (2) from J2 of IF preamplifier A2; P7 from J2, and P4 (3) from J3 of the target-track el IF amplifier.

u.2. Disconnect the coax connector P15 (8) from the image rejection mixer.

u.3. Disconnect P19 (1) from J1, and P2 (5) from J1.

u.4. Loosen four fasteners (6), and remove the monitoring panel (9).

u.5. Disconnect connectors P12 from J1 and P11 (7) from J2.



1. Connector P19
2. Connector P6
3. Connector P4

4. Connector P5
5. Connector P2
6. Fastener (4)

7. Connectors P11 and J2
8. Connector P15
9. Monitoring panel

Figure 43.3.1. Target-track receiver-transmitter—interior view.

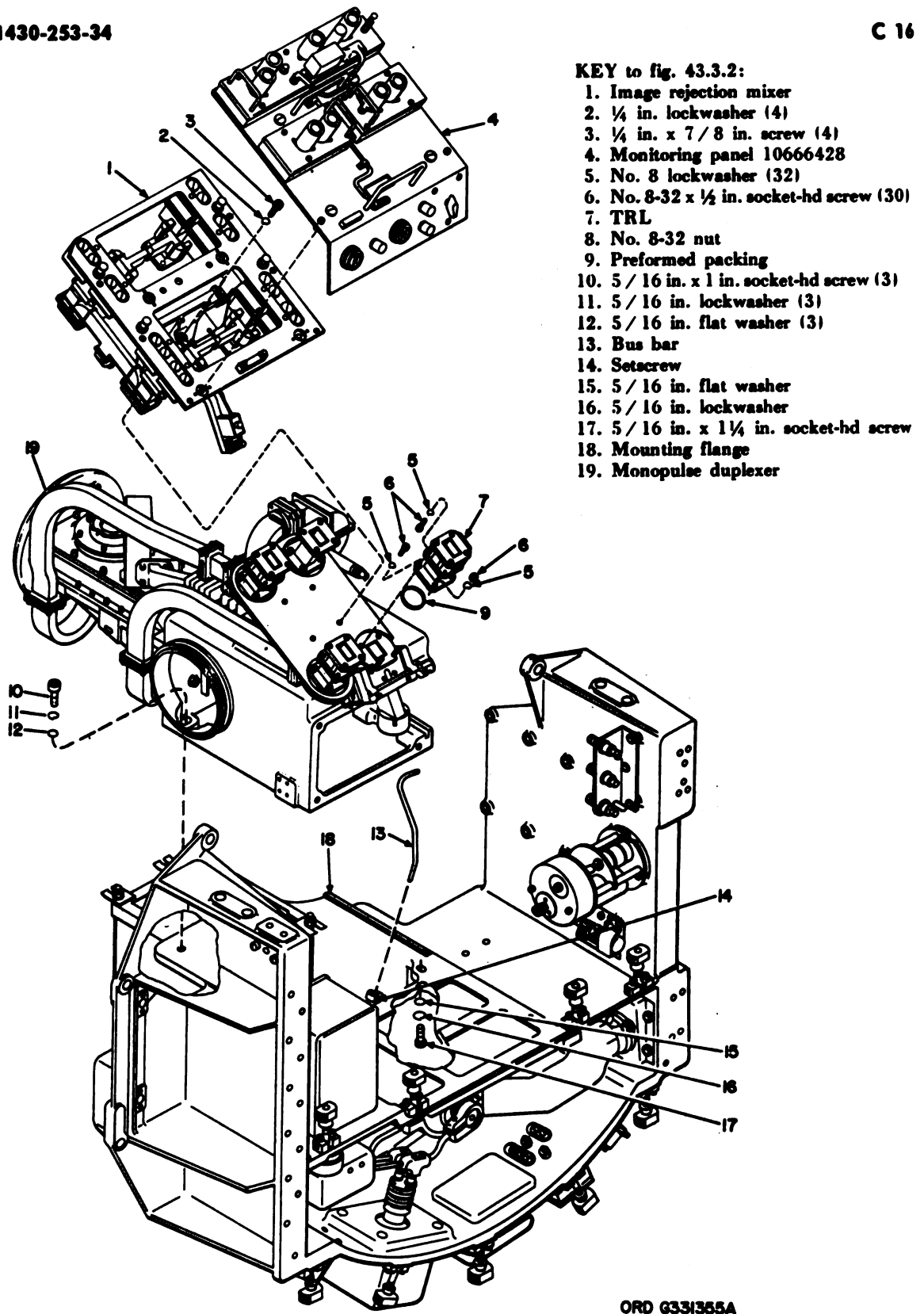
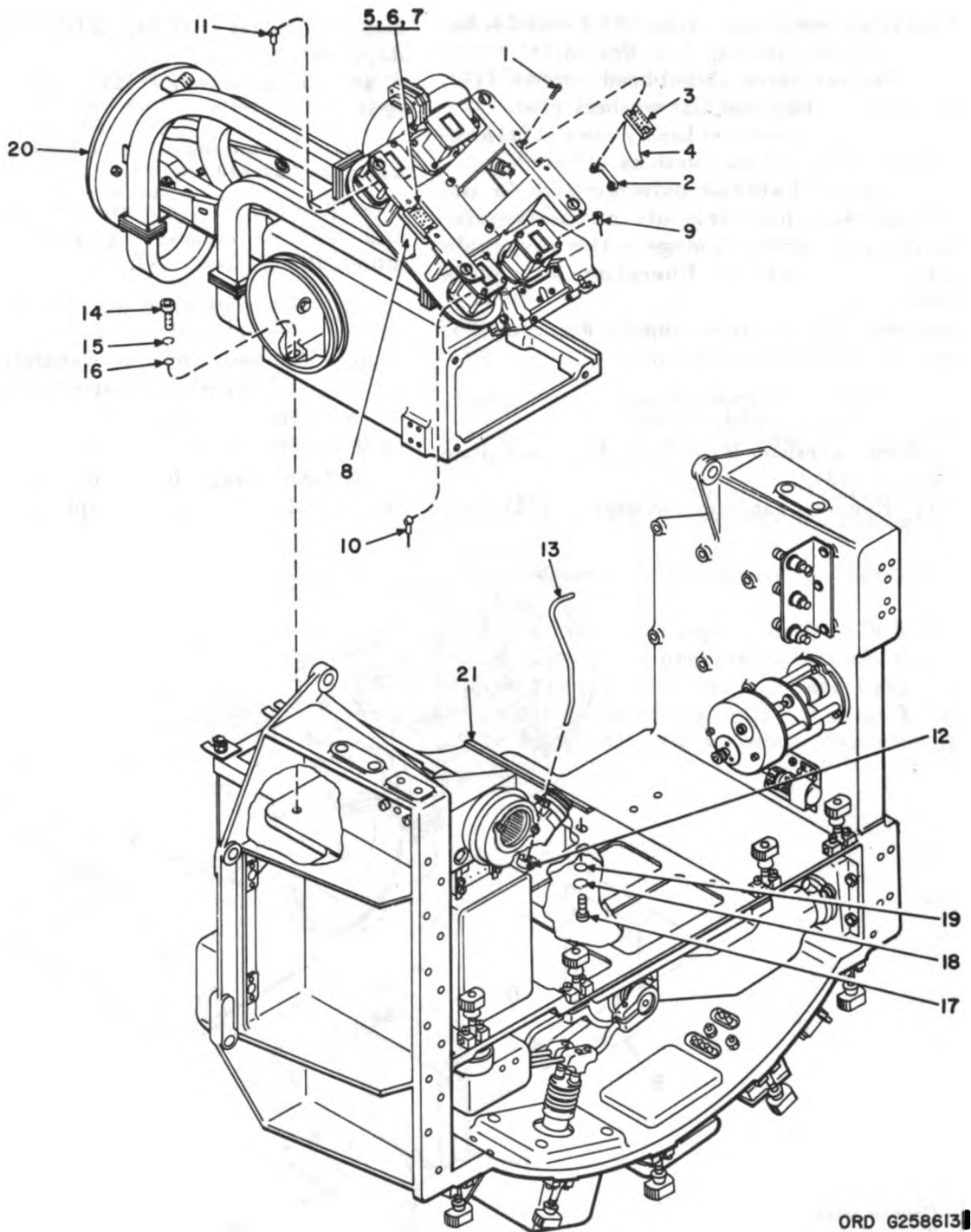


Figure 43.3.2. Target-track receiver-transmitter—Partial exploded view.



ORD 6258613

- | | | |
|--|-------------------------------------|--|
| 1. No. 4-40 X $\frac{3}{4}$ pan-hd screw (2) | 8. Wiring harness | 15. 5/16-in. lockwasher (3) |
| 2. Self-locking nut assy | 9. Lead clip | 16. 5/16-in. fl washer (3) |
| 3. Connector J8 | 10. Lead clip | 17. 5/16-18 X 1- $\frac{1}{4}$ socket-hd screw (4) |
| 4. Wiring harness | 11. Lead clip | 18. 5/16-in. lockwasher (4) |
| 5. No. 4-40 X $\frac{3}{4}$ pan-hd screw (2) | 12. Setscrew | 19. 5/16-in. fl washer (4) |
| 6. Self-locking nut assy | 13. Bus bar | 20. Monopulse duplexer |
| 7. Connector J7 | 14. 5/16-18 X 1 socket-hd screw (3) | 21. Mounting flange |

Figure 43.4. Missile-track receiver-transmitter—partially exploded view.

72.4.1

v. Loosen setscrews (12, fig. 43.4 and 24, fig. 43.5). Remove bus bar (13, fig. 43.4).

w. Remove three socket-head screws (14), lockwashers (15), and flat washers (16).

x. Remove four-socket head screws (17), lockwashers (18), and flat washers (19).

Caution: Exercise extreme care in the removal and handling of the monopulse duplexer to prevent damage to the waveguide components and the fiberglass waveguide cover.

y. Carefully remove monopulse duplexer (20) from the receiver-transmitter.

Note. The procedures in z through ab below apply to missile-track receiver-transmitter only.

z. Remove resistor R10 (7, fig. 43.5) and plate insulator (13).

aa. Remove capacitor assembly (18) and

adapter bracket assembly (20) from monopulse duplexer (21).

ab. Loosen setscrew (22) and remove lead (23).

Note. The procedures in ac below apply to receiver-transmitter 9141810 only.

ac. Remove capacitor assembly (5, fig. 43.6) and adapter bracket assembly (7) from monopulse duplexer (8).

Note. The procedures of ac.1 below apply to receiver-transmitter 9016323 only.

ac.1. Remove transmitter subassembly (2, fig. 43.4.1) and capacitor-resistor assembly (7).

Note. The magnetron mounting plate is electrically matched to the duplexer.

ad. Install magnetron mounting plate (G, fig. 39 or 5, fig. 42) on old duplexer.

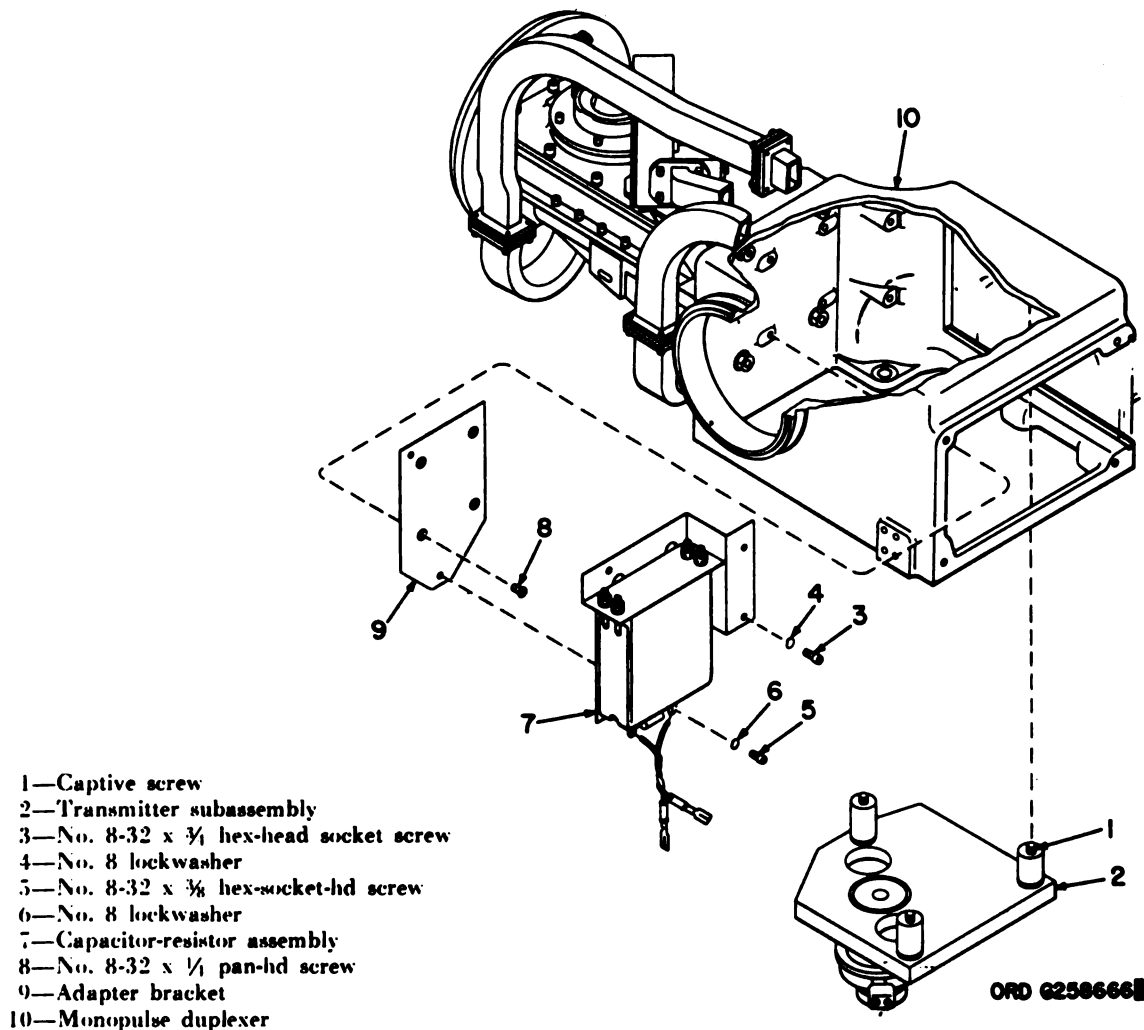


Figure 43.4.1. Receiver-transmitter subassembly—partially exploded view.

51.2 Installation of Monopulse Duplexer

Caution: Exercise extreme care in handling the monopulse duplexer to prevent damage to the waveguide components and the fiberglass waveguide cover.

Note. R16 of the RF power monitor must be matched to the duplexer. Change as necessary.

a. Remove magnetron mounting plate (G, fig. 39 or 5, fig. 42) from the new monopulse duplexer.

Note. The procedures in b through d below apply to missile-track receiver-transmitter only.

b. Install adapter bracket assembly (20, fig. 43.5) and capacitor assembly (18) in new duplexer (21).

c. Install plate insulator (13) and block (12).

d. Install resistor R10 (7) and lead (23). Tighten setscrew (22).

Note. The procedures in e below apply to receiver-transmitter 9141810 only.

e. Install adapter assembly (7, fig. 43.6) and capacitor assembly (5).

Note. The procedures in e.1 and e.2 below apply to receiver-transmitter 9016323 only.

e.1. Apply sealing compound 8030-174-2599 to the threads of four screws (8, fig. 43.4.1) and install bracket (9).

e.2. Install capacitor-resistor assembly (7) and transmitter assembly (2).

f. Clean surface of modulator housing in the area where the monopulse duplexer is to be mounted.

g. Carefully place duplexer (20, fig. 43.4) into position in the receiver-transmitter.

h. Install four flat washers (19), lock washers (18), and socket-head screws (17). Do not tighten the screws.

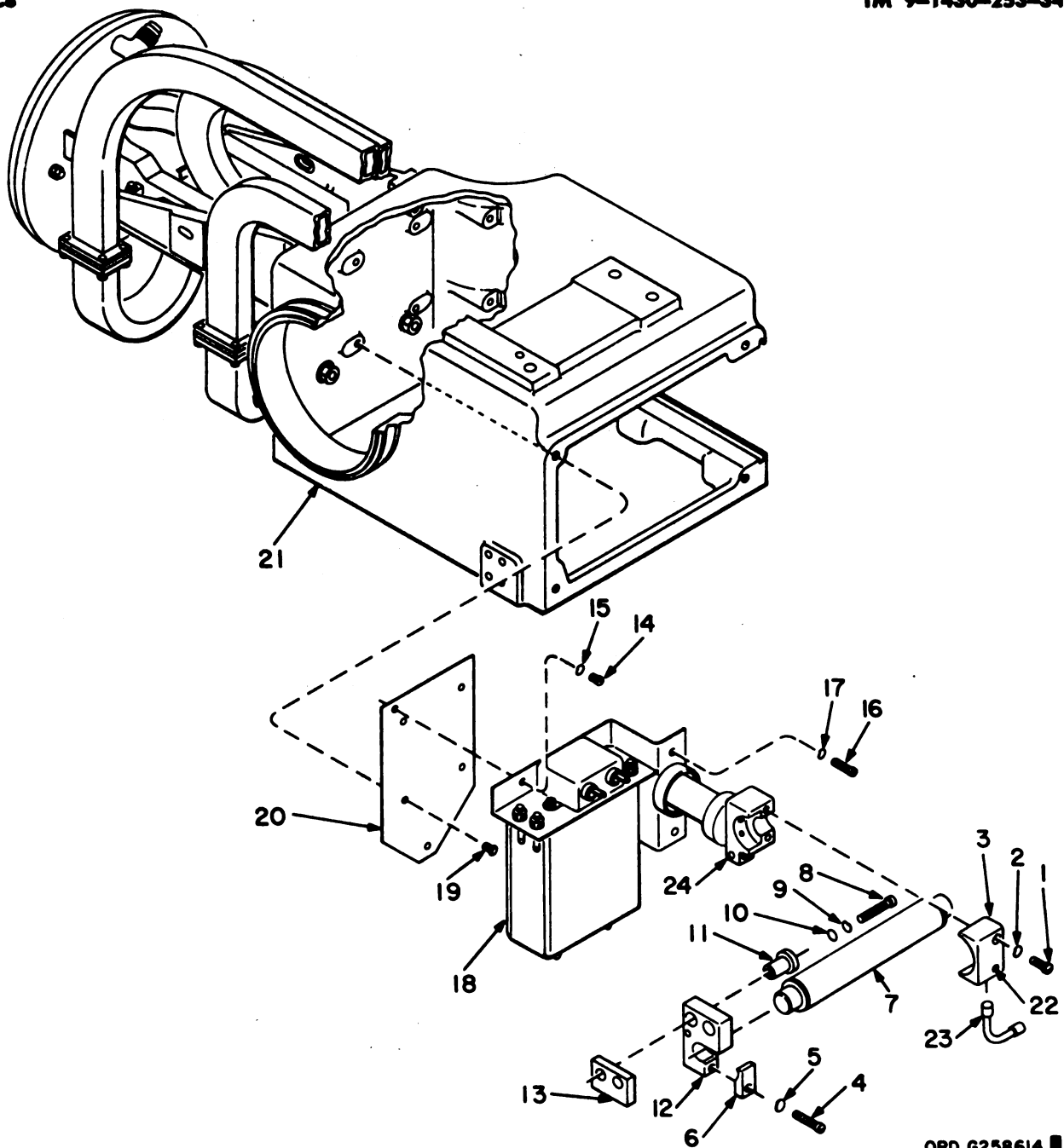
i. Install three flat washers (16), lockwashers (15), and socket-head screws (14). Do not tighten the screws.

j. Place braces (13, and 11, fig. 43.1) in position, and install four flat washers (8), two lockwashers (7) and two hexagon nuts (6). Do not tighten the nuts.

k. Install four flat washers (3) lockwashers (2), and socket-head screws (1). Do not tighten the screws.

k.l. Perform the procedures of paragraph 35.1.1.

l. Using telescoping gage STR-No. 579-B (fig. 2.4), determine the dimensions between flange on antenna support (1, fig. 43.7) and flange on receiver-transmitter housing (2) at point Y (4) and point X (5), and at points diametrically opposite.

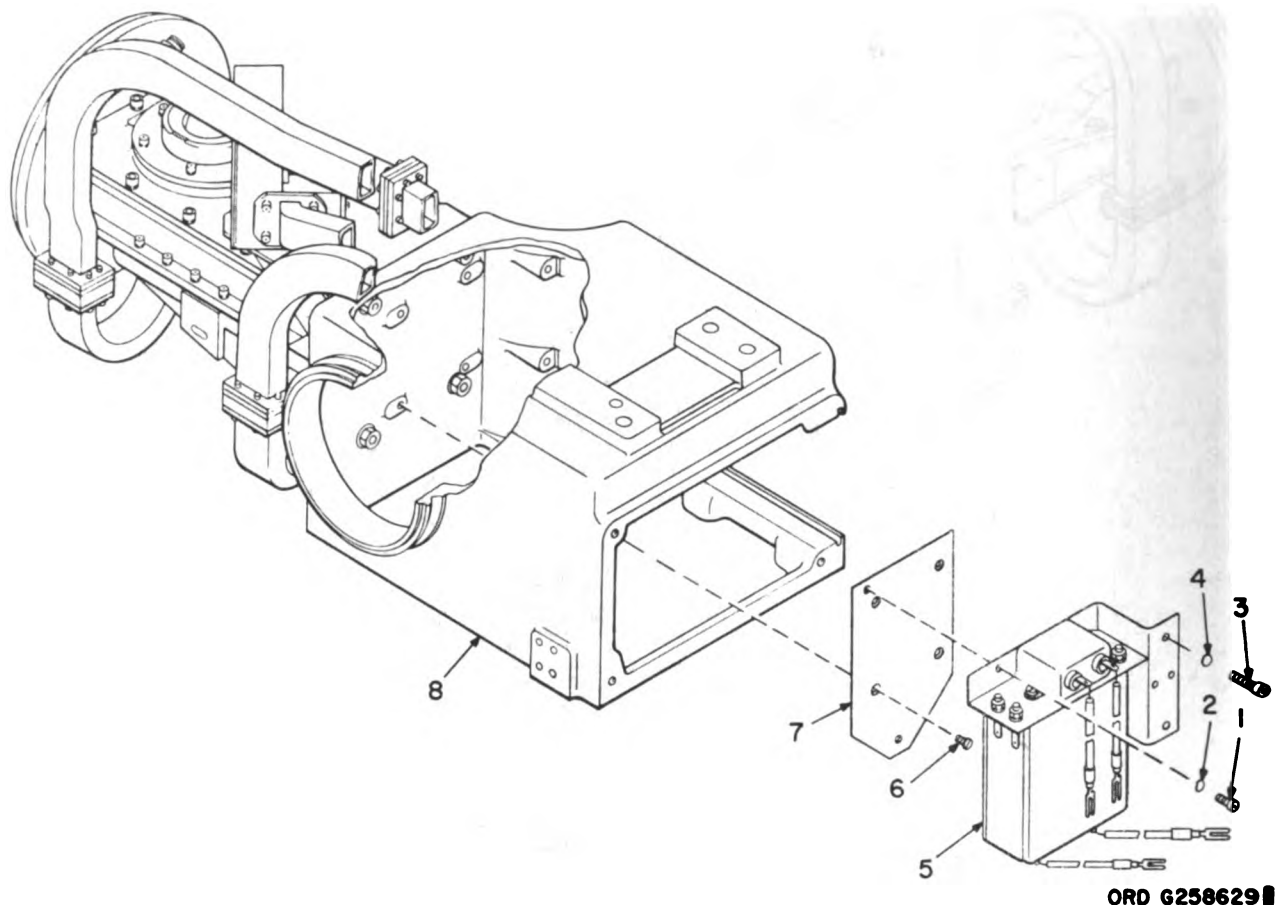


ORD G258614

- 1—No. 8-32 x 7/8 fl hd screw MS35267-48
- 2—No. 8 lock washer MS35338-23
- 3—Clamp 8520469
- 4—No. 8-32 x 7/8 fl hd screw 131983
- 5—No. 8 lock washer 121841
- 6—1-in.-lg. clamp 8520410
- 7—Resistor R10 8520399
- 8—No. 6-32 x 1-1/4 fl hd screw 131924 (2)
- 9—No. 6 lock washer 131044 (2)
- 10—No. 6 fl washer 131014 (2)
- 11—Bushing insulator 8520408 (2)
- 12—Block 8520411

- 13—Plate insulator 8520411
- 14—No. 8-32 x 3/8 socket hd screw 583885 (2)
- 15—No. 8 lock washer MS35338-22 (2)
- 16—No. 8-32 x 3/4 socket hd screw 583888 (2)
- 17—No. 8 lock washer MS35338-22 (2)
- 18—Capacitor assy 9007945
- 19—No. 8-32 x 1/4 pan-hd screw MS35225-41 (4)
- 20—Adapter bracket assy 9007942
- 21—Monopulse duplexer 9159973
- 22—No. 8-32 x 3/16 setscrew 192208
- 23—Lead 8520473
- 24—No. 8-32 x 3/16 setscrew 192208

Figure 43.5. Missile track receiver-transmitter subassembly—partially exploded view.



ORD G258629

- 1—No. 8-32 x 3/8 socket hd screw 583885 (2)
- 2—No. 8 lock washer MS35338-22 (2)
- 3—No. 8-32 x 3/4 socket hd screw 583888 (2)
- 4—No. 8 lock washer MS35338-22 (2)

- 5—Capacitor assy 9142835
- 6—No. 8-32 x 1/4 pan-hd screw MS35225-41 (4)
- 7—Adapter bracket assy 9007942
- 8—Monopulse duplexer 9141810

Figure 43.6. Target track receiver-transmitter subassembly—partially exploded view.

at point X and point Y. If the dimensions are not equal, loosen eight screws (12, fig. 43.1), and adjust azimuth tilt adjusting screw (6, fig. 43.7) or elevation tilt adjusting screw (3, fig. 43.7), or both, to obtain equal dimensions at the four points. Tighten eight screws (12, fig. 43.1).

Caution: To prevent damage to the duplexer housing, apply only enough force to properly position the duplexer.

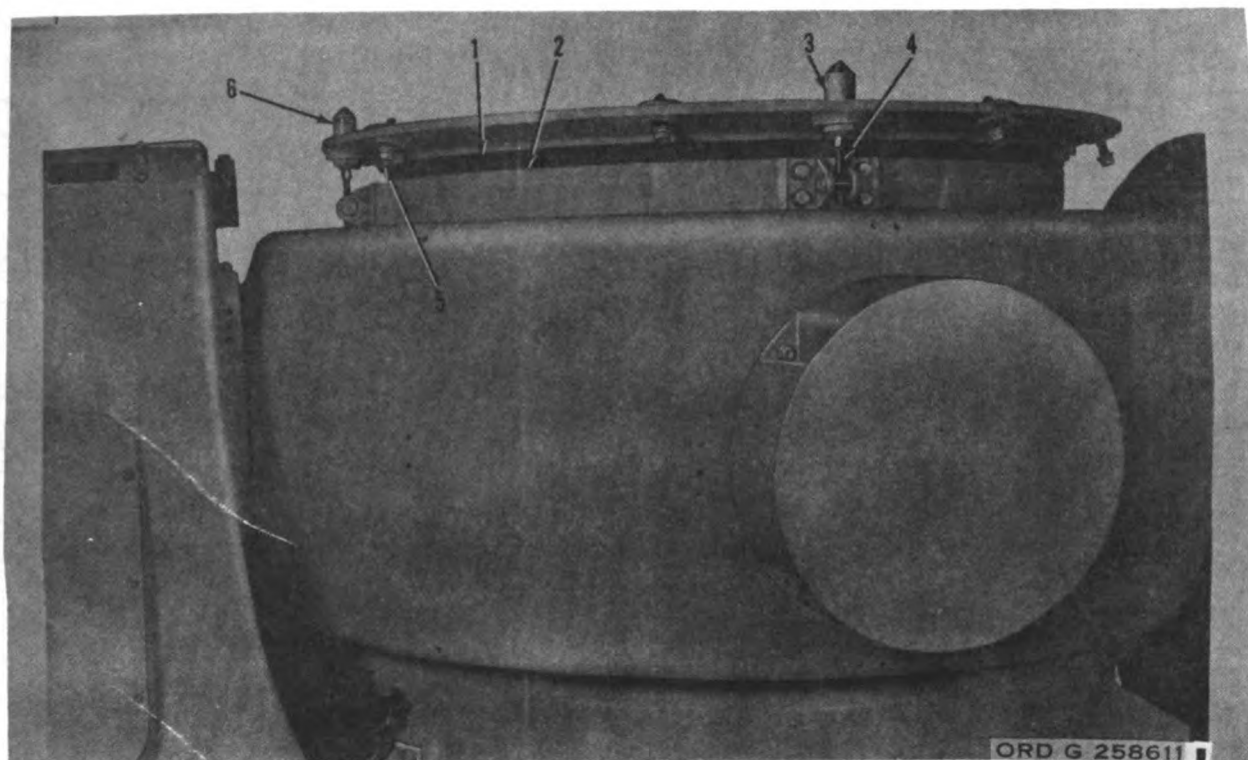
m. Obtain holding tool WECO-C632531 (fig. 2.4) and insert tool through front of receiver-transmitter, between monopulse duplexer housing (10, fig. 43.1) and raised flange (11, fig.

43.3) of modulator housing. Using the holding tool as a lever, force the duplexer against mounting flange (21, fig. 43.4).

n. Remove waveguide cover (5, fig. 43.8).

Caution: With the reflector assembly removed, the receiver-transmitter is unbalanced. Before releasing elevation lock, make certain that sufficient personnel are available to hold the receiver-transmitter.

o. Disengage the elevation lock (fig. 29) and position the receiver-transmitter to approximately 260 mils elevation. Engage the elevation lock.



1—Antenna support
2—Receiver-transmitter housing
3—Elevation tilt adjusting screw

4—Point Y
5—Point X
6—Azimuth tilt adjusting screw

Figure 43.7. Adjustment of antenna support.

Caution: The locating gage WECO-RN504174 is used for precise measurements, use caution in handling to prevent damage to the instrument.

p. Obtain locating gage WECO-RN504174 (fig. 2.3) with the calibration subassembly block (1, fig. 43.9) installed in the center block (2, fig. 43.9) as shown.

q. Zero the four dial indicators (3, fig. 43.9) by rotating the movable dial (4, fig. 43.9) on each indicator. Lock each dial with lock screw (5, fig. 43.9).

r. By moving dial indicator extension (6, fig. 43.9) make certain that each indicator pointer has approximately 1-1/2 to 2 revolutions of free travel.

s. Carefully remove the calibration subassembly block (1, fig. 43.9) from the locating gage.

t. Install locating gage (1, fig. 43.10) on antenna support (2, fig. 43.10) following procedures in (1) through (8) below:

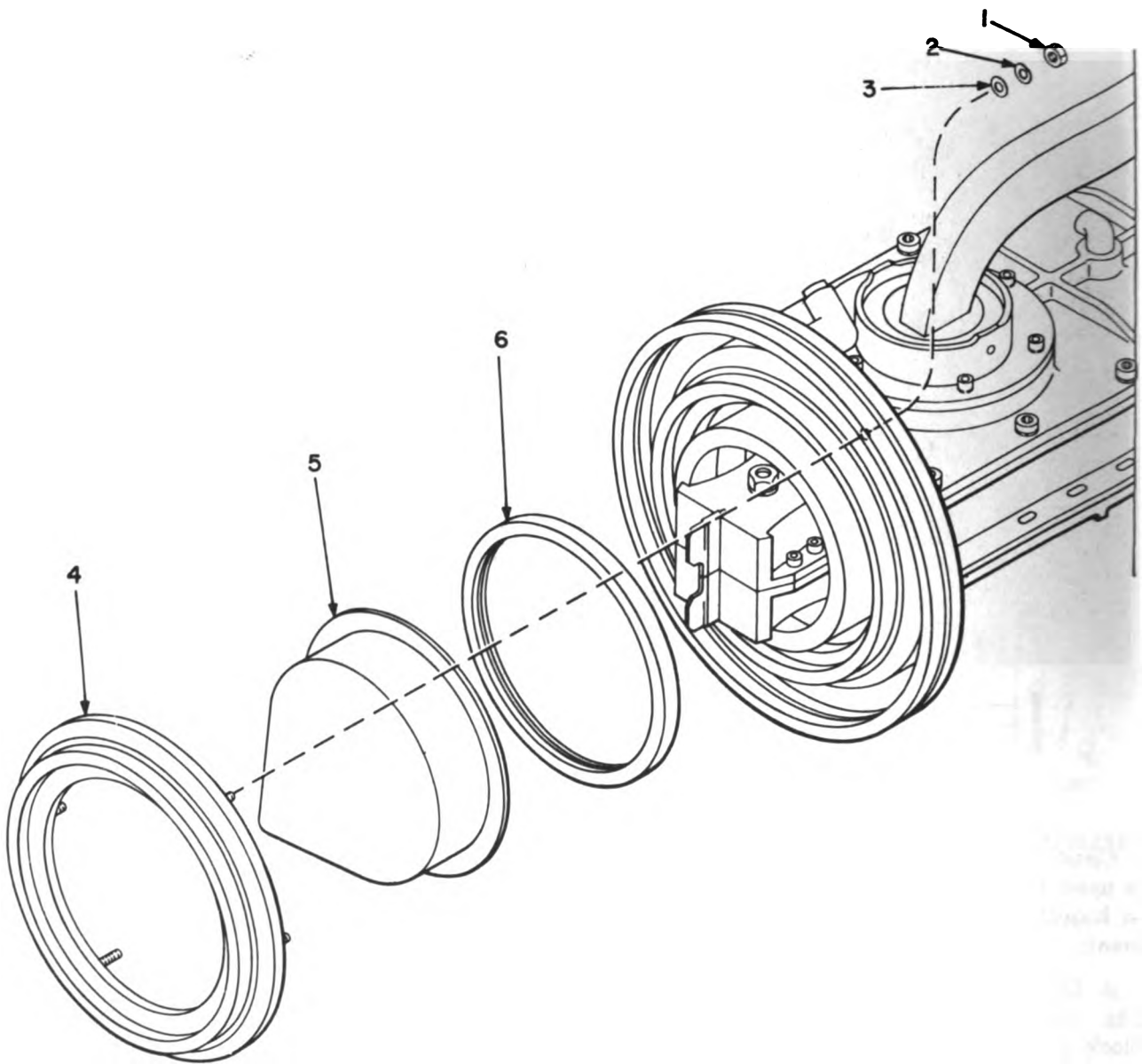
- (1) Place locating gage on antenna support approximately 45° clockwise from position shown in figure 43.10.
- (2) Using care to prevent damage to the dial indicators (6, fig. 43.10) rotate locating gage counterclockwise until bottom leg (7, fig. 43.10) contacts guide pin (8, fig. 43.10).

Note. If the locating gage is not equipped with cam lock screw handles (fig. 2.3) pliers may be required to securely tighten cam lock screws.

- (3) Secure locating gage in position by tightening three cam lock screws (4, fig. 43.10). Tighten three locking blocks (5, fig. 43.10).

Note. The vertical vane (9, fig. 43.10) will extend beyond the center block surface.

u. Using a straight edge on the surface of center block (10, fig. 43.10) move monopulse duplexer forward until the front edge of wave-



ORD 6258615

- 1—No. 6-32 hex nut MS35649-62 (6)
 2—No. 6 lock washer MS35338-22 (6)
 3—3/8-in. fl washer MS15795-206 (6)

- 4—Electrical clamp 8174222
 5—Waveguide cover 9006436
 6—Rubber seal 8515125

Figure 43.3. Waveguide assembly 9006500—partially exploded view—typical.

guide assembly (3, fig. 43.10) is flush with the center block surface.

v. Make certain the duplexer housing is positioned flush against mounting flange (21, fig. 43.4). If not repeat procedures in *m* above.

w. Secure duplexer in position by tightening screws installed in *h* and *i* above.

x. To make certain that each dial indicator

(6, fig. 43.10) is reading on the same pointer revolution, repeat procedures in *r* above.

y. Note and record the indication of each dial indicator (6, fig. 43.10). The indication should be 0 ± 0.005 inch. If the indication cannot be obtained, loosen the screws tightened in *w* and repeat the procedures in *u* through *y* above.

z. If the proper indication is obtained, pro-

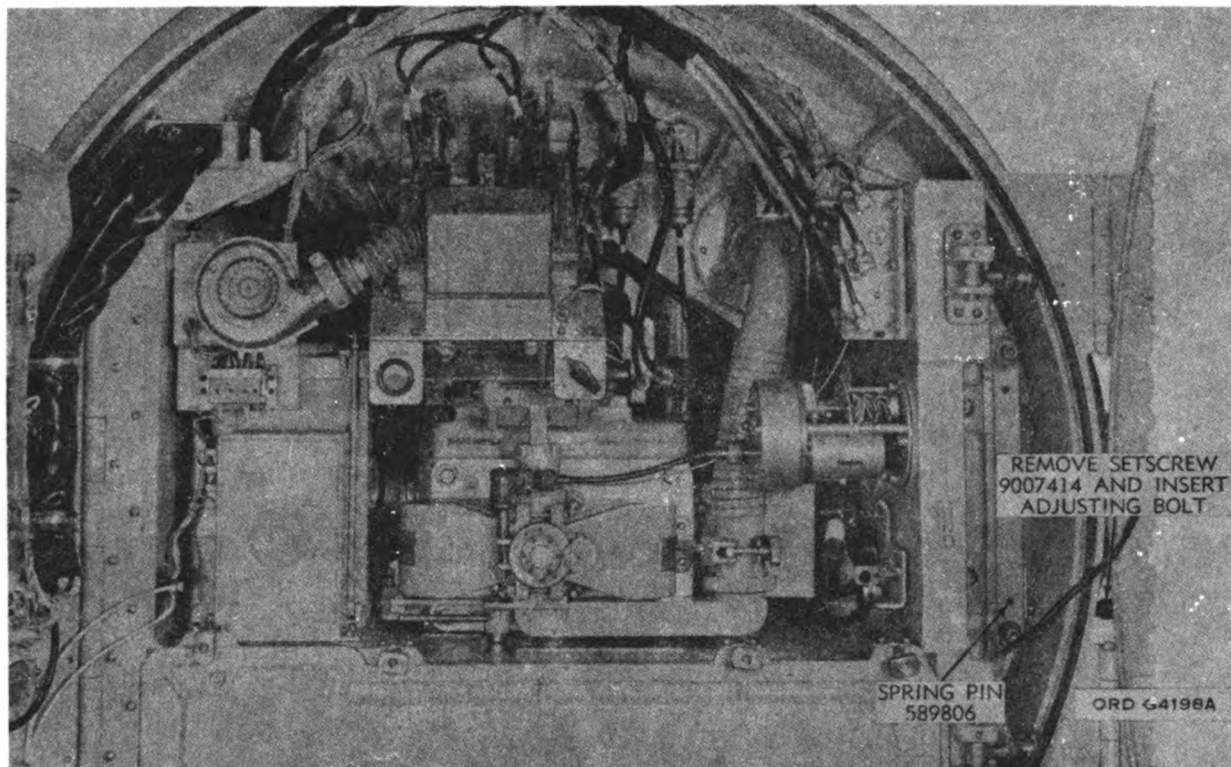


Figure 43.8.1. Radar receiver-transmitter—partial view.

ceed to *aa* below. If the proper indication cannot be obtained, perform the procedures in *z.1* through *z.8* below.

Notes. There is one setscrew on each side of the radar receiver-transmitter housing and one setscrew at the bottom of the housing.

z.1. Remove and retain three setscrews 9007414 (fig. 43.8.1) from the outside of the housing. Insert two adjusting bolts 9138223 in the setscrew holes on each side of the housing, and insert adjusting bolt 9138224 in the setscrew hole at the bottom of the housing. Run the adjusting bolts in against the modulator housing.

z.2. Drive two spring pins 589806 (fig. 43.8.1) through the modulator housing and back into the receiver-transmitter housing.

z.3. Loosen the nine screws which secure the radar modulator to the receiver transmitter housing one-half turn.

z.4. Adjust the bolts installed in *z.1* above until the dial indicators on the locating gage indicate as close to zero as possible. The two

horizontal indicators should be within 0.005 inch of each other and the two vertical indicators should be within 0.005 inch of each other.

z.5. Check to see if the indicators still have the approximate same amount of free travel that was observed in *r* above. If not, the indicators are on different revolutions, and more adjustment of the bolts installed in *z.1* is necessary.

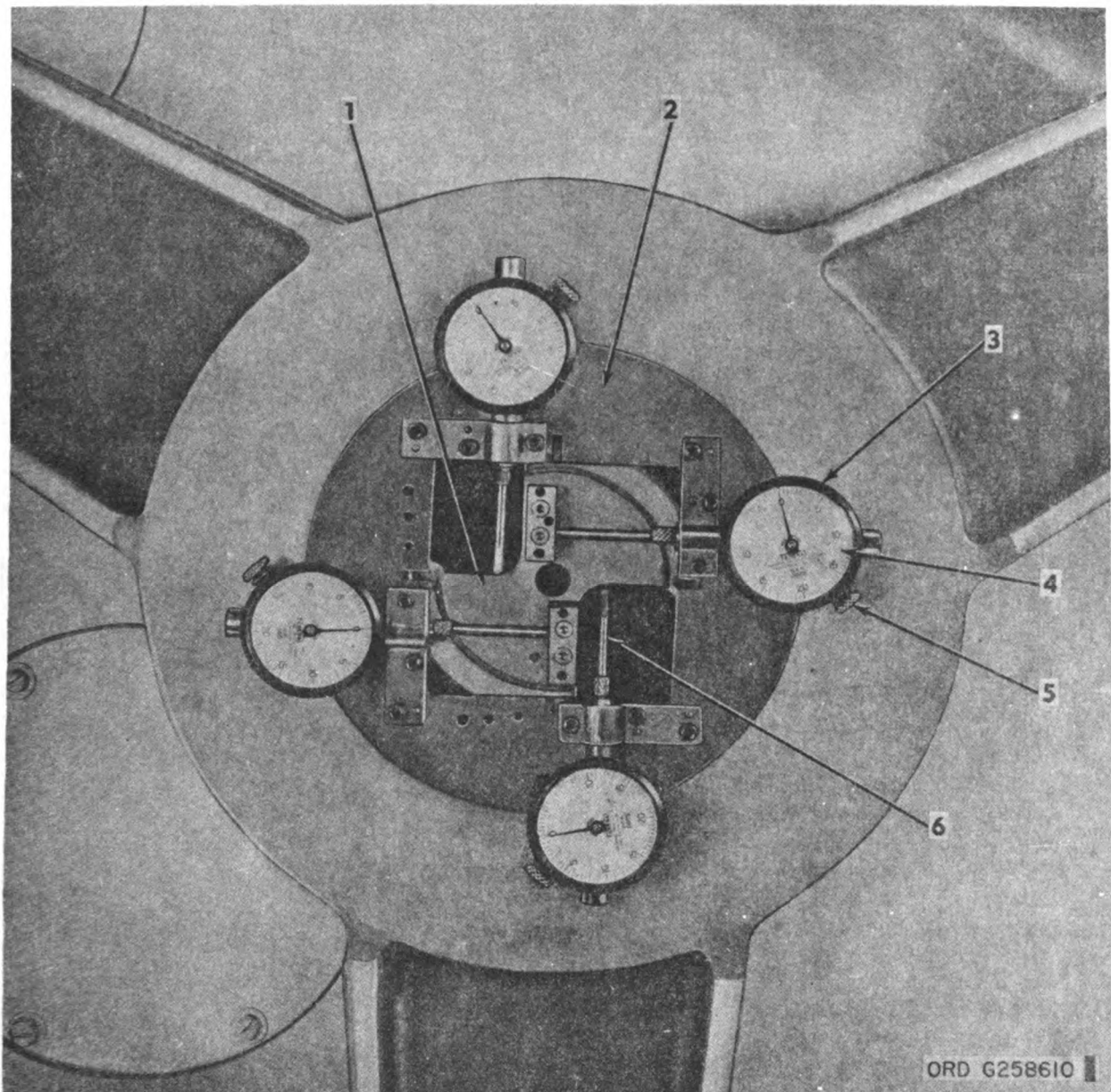
z.6. Tighten the nine screws, loosened in *z.3* above, in diametrically opposite sequence.

z.7. If tightening the nine screws changes the indication of the dial indicator so that the tolerances specified are not maintained, repeat the procedures in *z.3* through *z.6* above.

z.8. Remove the three adjusting bolts installed in *z.1* above.

z.9. Apply a sealing compound to the threads of three setscrews 9007414 retained in *z.1* above, and install the setscrews.

aa. Position the two braces (11 and 13, fig. 43.1)



- 1—Calibration subassembly block (f/w locating gage)
 2—Center block
 3—Dial indicator (4)

- 4—Movable dial (4)
 5—Lock screw (4)
 6—Dial indicator extension (4)

Figure 43.9. Locating gage WECO-RN504174.

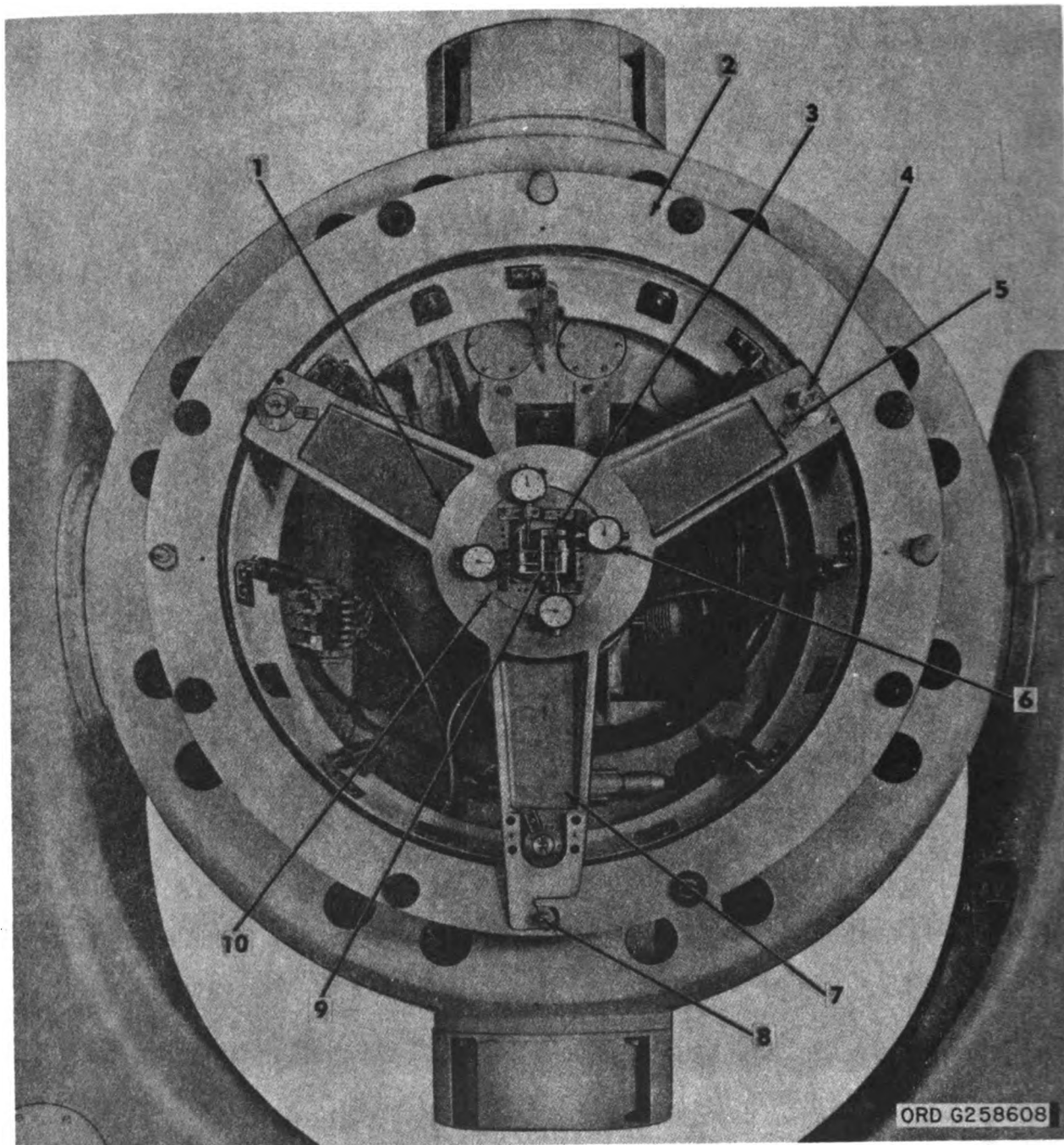
and tighten four screws (1, fig. 43.1) and two nuts (6, fig. 43.1). Make certain the indications recorded in *y* above are not disturbed.

ab. Remove locating gage (1, fig. 43.10) from antenna support (2, fig. 43.10). Install the calibration subassembly block (1, fig. 43.9) in the center block (2, fig. 43.9) and store the locating gage in protective case.

ac. Install waveguide cover (5, fig. 43.8).

ad. Connect rear hose assembly (1, fig. 43.2), front hose assembly (2, fig. 43.2), and bottom hose assembly (3, fig. 43.2) on monopulse duplexer (6, fig. 43.2).

ae. Push stop block (4, fig. 43.2) tight against duplexer housing and tighten two hexagon socket head screws (5, fig. 43.2).



- 1—Locating gage WECO-RN504174
- 2—Antenna support
- 3—Front edge of waveguide assy
- 4—Cam lock screw (3)
- 5—Locking block (3)

- 6—Dial indicator (4)
- 7—Bottom leg
- 8—Guide pin
- 9—Vertical vane
- 10—Center block

Figure 43.10. Target or missile track receiver-transmitter—front view with locating gage installed.

af. Install bellows (5, fig. 43.1) on monopulse duplexer housing (10) and secure with grooved coupling clamp (4).

ag. Install bus bar (13, fig. 43.4), and secure with setscrews (12 and 24, fig. 43.5).

Note. The procedures in step **ah** through **al** apply to the missile tracking receiver-transmitter only.

ah. Install connector J7 (7, fig. 43.4) and attached wiring harness (8). Secure connector to duplexer with self-locking nut assembly (6) and two pan head screws (5).

ai. Install connector J8 (3) and attached wiring harness (4). Secure connector to duplexer with self-locking nut assembly (2) and two pan-head screws (1).

aj. Connect lead clips (9, 10, and 11) to electron tubes V5, V6, and V7, respectively.

ak. Install track amplifier-converter (8, fig. 43.3), and secure with four fasteners (7).

al. Connect connectors P7 (3) to J2, P6 (4) to J2, P4 (5) to J3, and P5 (6) to J2).

Note. The procedures in step **al.1** through **al.7** apply to the target-tracking receiver-transmitter only.

al.1. Install the monitoring panel (9, fig. 43.3.1), and secure with four fasteners (6).

al.2. Connect P19 (1) to J1 on the monitoring panel.

al.3. Connect P2 (5) to J1 on the image rejection mixer.

al.4. Connect P15 (8) to the image rejection mixer.

al.5. Connect P7 to J2 and P4 to J3 (3) on the target-track elevation IF preamplifier.

al.6. Connect P6 (2) to J2 on the azimuth IF preamplifier.

al.7. Connect P5 (4) to the T connector on J2 on the sum IF preamplifier.

am. Connect air duct hose (2, fig. 43.3) and tighten conduit coupling (1).

an. Connect connectors P12 (9) to J1 and P11 (10) to J2.

Note. The magnetron mounting plate (G, fig. 39) is electrically matched to the duplexer. Make certain the mounting plate removed in **a** above is installed on the new duplexer.

ao. Install pulse transformer group (para 43 or 44).

ap. Install pressurization unit (para 53).

aq. Install modulator cover (fig. 30), and secure with nine modulator cover clamps.

ar. Close and secure track RF control-power-supply group.

as. Close cover (fig. 29) and secure with four clamps.

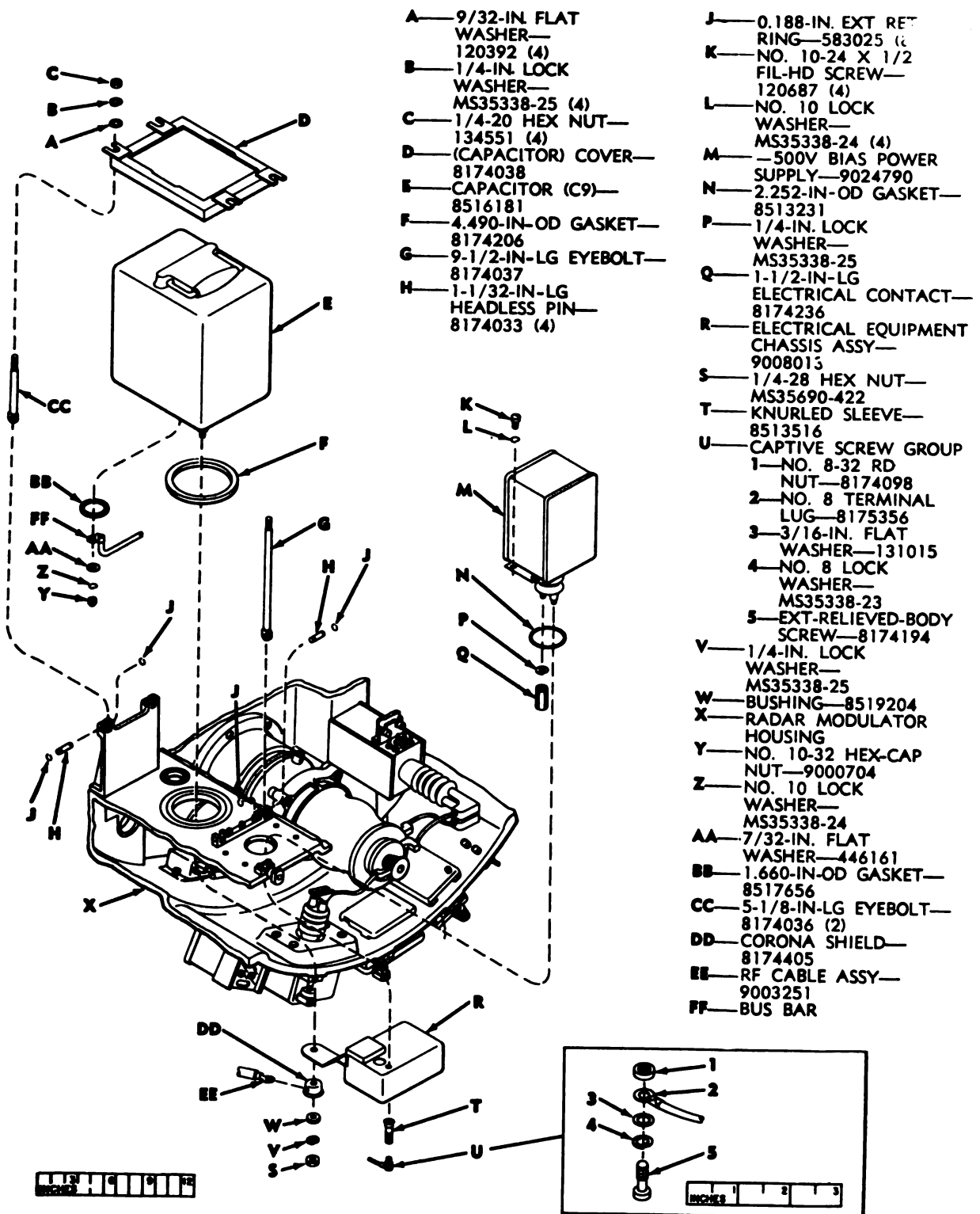
at. Install track antenna reflector in accordance with the assembly and emplacement manual (para 3).

au. Perform the following checks in accordance with the track check procedures manual (para 3):

(1) Transmitter.

(2) Reflector tilt.

av. Install the radome in accordance with the assembly and emplacement procedures manual (para 3).



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Figure 44. Radar modulator - partially exploded view No. 2.

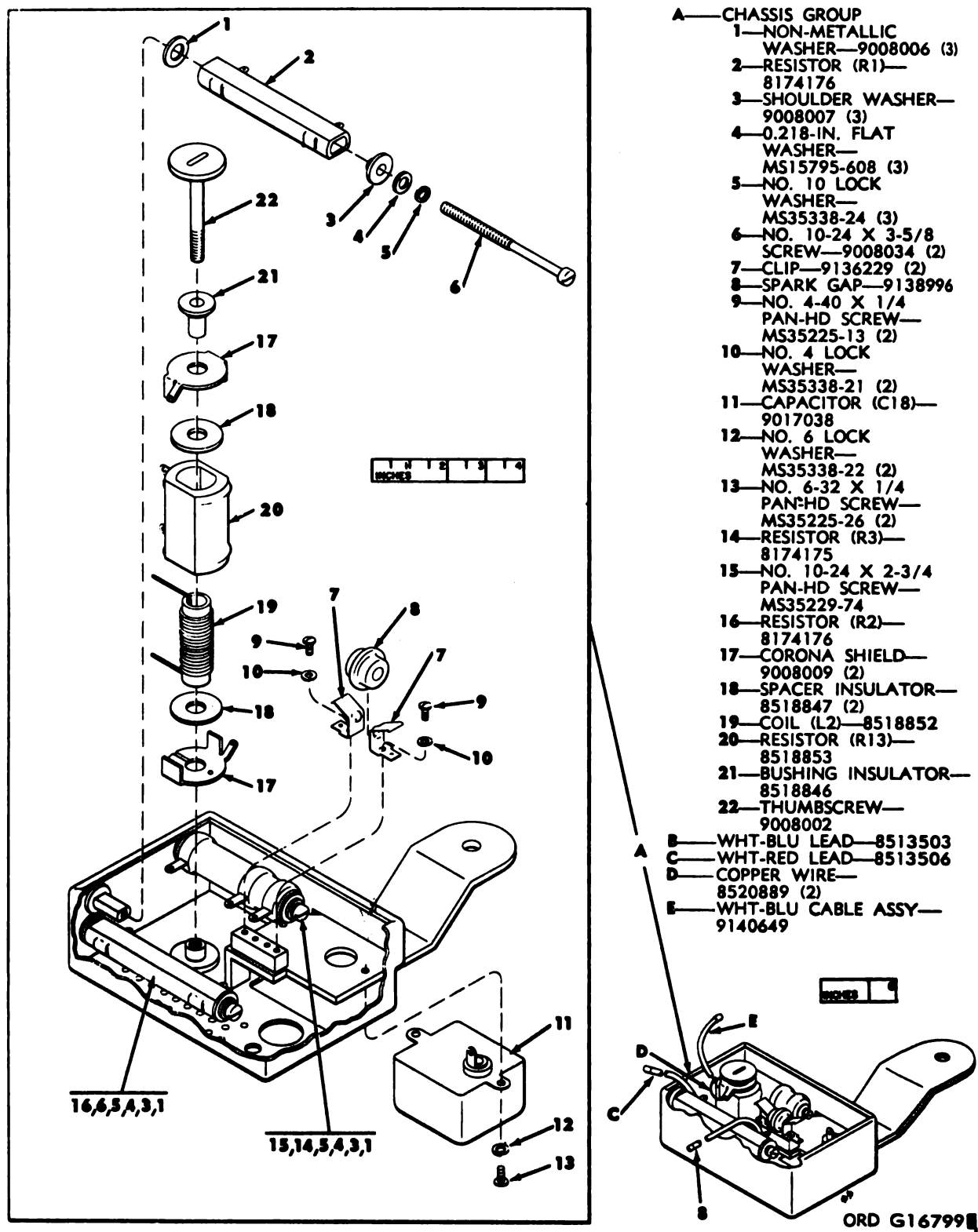


Figure 45. Electrical equipment chassis assembly 9008013 - partially exploded view.

Section IV. MISCELLANEOUS ITEMS

Warning: All maintenance on the target- or missile-track receiver-transmitter shall be performed with the **TARGET POWER** switch or the **MISSILE POWER** switch, as applicable, on the radar-power control in the off position.

Caution: The magnetron electron tube contains a strong magnet. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron electron tube to prevent damage.

52. Dehumidifier

a. Removal.

(1) Gain access to the receiver-transmitter RF enclosure (para 11.11.3).

(2) Disconnect and tag the air hoses from the outlet and inlet connections (6 and 7, fig. 46).

(3) Disconnect P2 (1) from J1.

(4) Release two power supply clamps (fig.

30), and open track RF control-power supply group.

(5) Remove four pan-head screws and lock-washers (fig. 30 and 3 and 4, fig. 46), and remove the dehumidifier (2).

b. Installation.

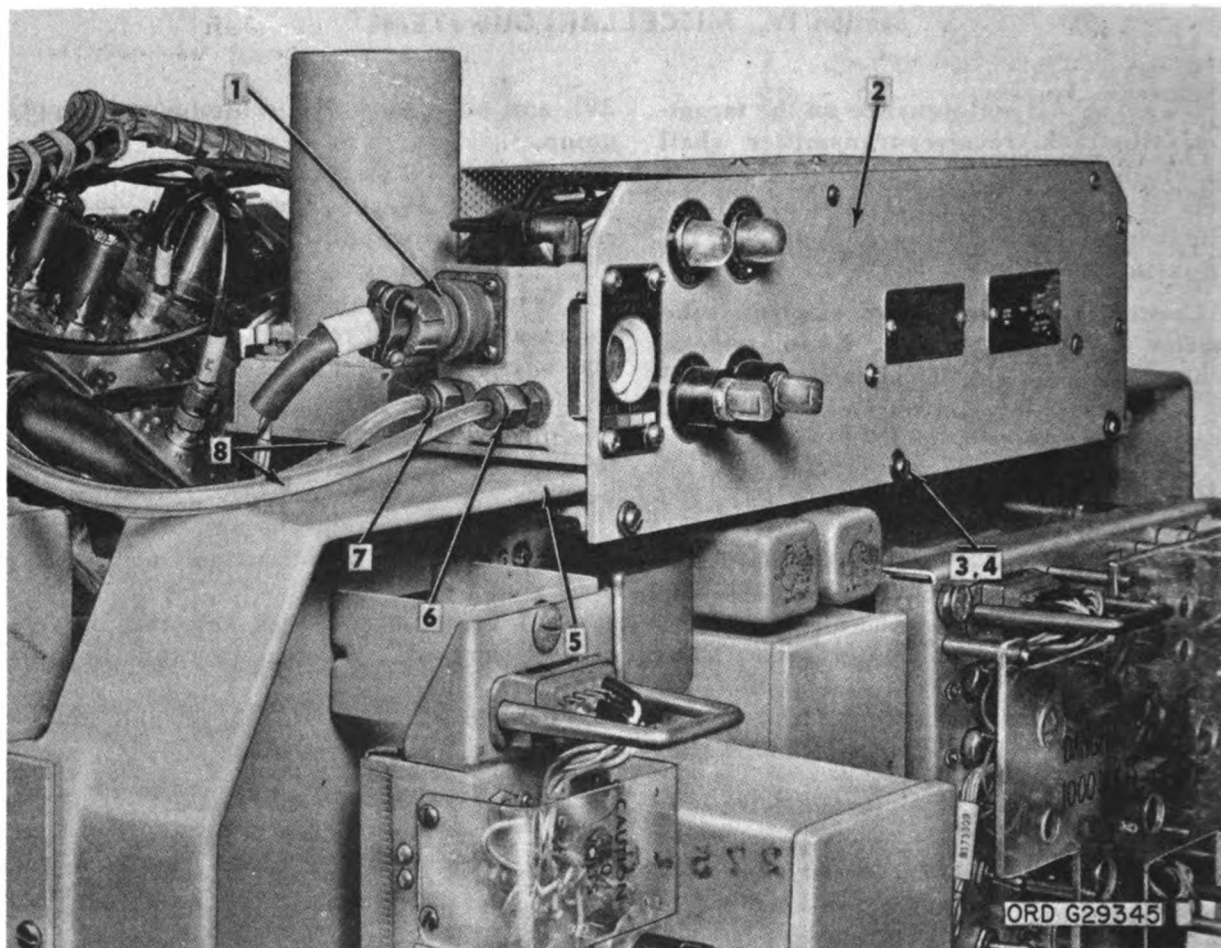
(1) Position and secure the dehumidifier in the reverse order of removal, a (5) through (3) above.

(2) Apply sealing compound 8030-893-4816 to the threads of the air connections (6 and 7), and connect the air hoses to the air connections.

(3) Apply power to the unit in accordance with operator and organizational maintenance manual (para 3).

(4) Using soapy water, test the air connections for leaks. Tighten the connections as necessary.

(5) Complete installation in the reverse order of removal, a above.



- 1—Connectors P2 and J1
- 2—Dehumidifier
- 3—No. 8-32 x 5/16 pan-hd screw (3)
- 4—No. 8 lockwasher (3)

- 5—Track RF control-power supply group
- 6—Outlet connection
- 7—Inlet connection
- 8—Air hoses (2)

Figure 46. Dehumidifier—locational view.

53. Pressurization Unit

Warning: The track receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Gain access to the unit as specified in the procedures.

a. Removal.

(1) Gain access to the rear of the receiver-transmitter enclosure in accordance with paragraph 11.11.3.

(2) Gain access to the pressurization unit by disconnecting the following items:

- (a) Arc suppressor lead (F, fig. 31).
- (b) Air duct coupling (11, fig. 46.1).

Note. For the MTR, loosen three captive screws, and remove the entire magnetron tuning drive with flexible shaft (13) instead of performing (3) below.

(3) Disconnect the knurled nut (14, fig. 46.1); remove the attaching hardware (5, 6, and 7); and remove the forward section of the magnetron tuning drive (8).

(4) Disconnect the electrical connectors (1), and disconnect air base (2) from elbow (3).

(5) Loosen captive screws (9), and remove the pressurization unit.

b. Installation.

Note. Apply sealing compound 8030-893-4816 to the elbow (3) before connecting the hose.

(1) With the exception of the magnetron tuning drive (8) and flexible shaft (13), replace the pressurization unit in the reverse order of removal, *a* above.

(2) Check that the indications on the magnetron tuning drive dial and magnetron dial (H and Q, fig. 31) are identical. Rotate the flexible shaft as necessary to establish this condition.

Note. If only the forward section of the magnetron tuning drive was removed, apply antiseize compound 8030-251-3983 to the threads of the screws (5) before installation.

(3) Replace the magnetron tuning drive (8),

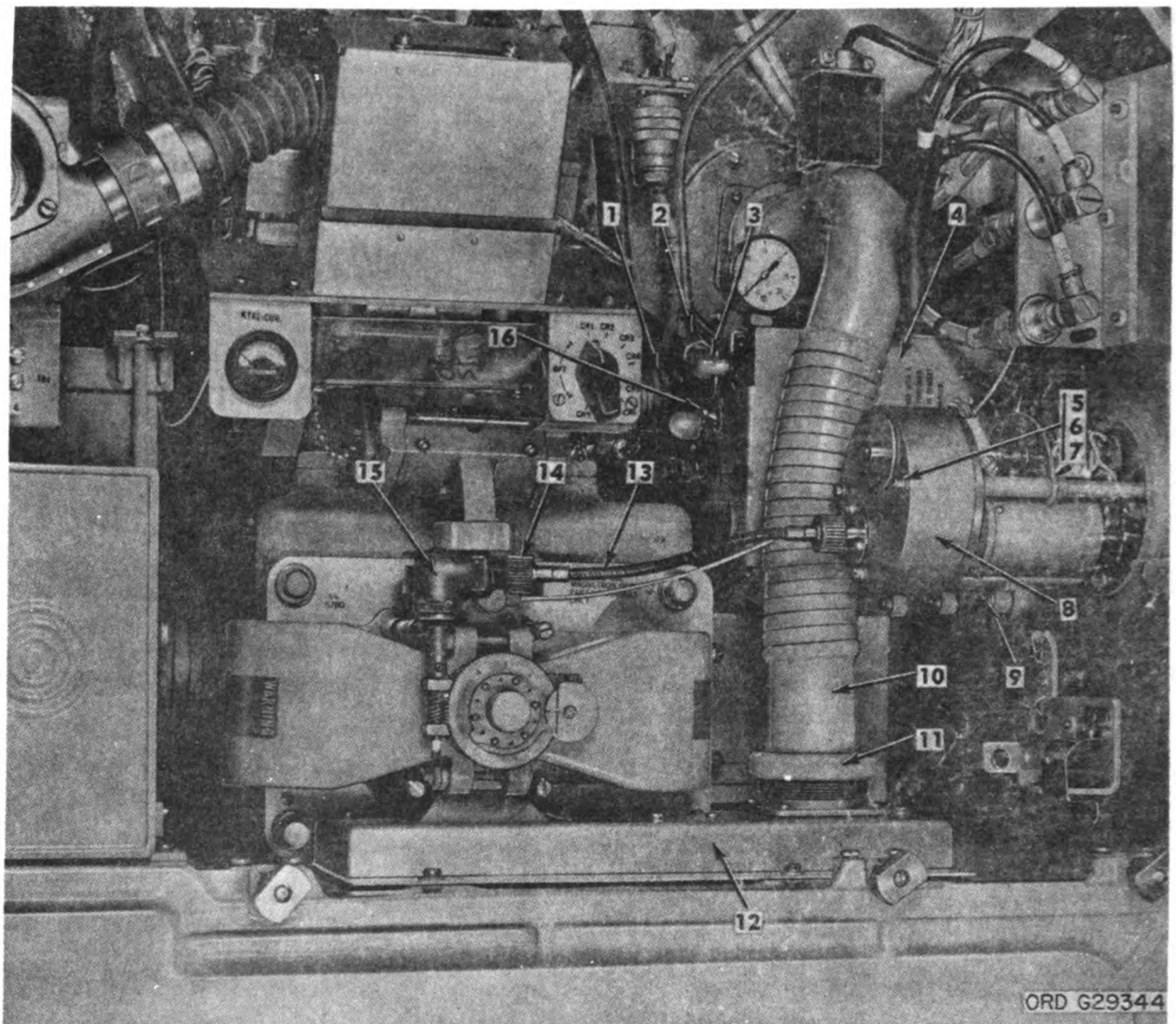
and reconnect the flexible shaft (13).

Note. A small amount of soapy water is suitable for inspection for air leaks.

(4) Energize the pressurization unit by setting the missile power or TARGET POWER and MAIN POWER switches on the radar power control panel to ON. Check for air leaks. Tighten connections as necessary.

(5) Deenergize the pressurization unit, and return the system to normal operation (para 11.11.3).

(6) Perform the daily transmitter checks in accordance with the check procedures manual (para 3).



1. Connectors J13 and J3
2. Air outlet hose
3. Elbow (p/o pressurization unit)
4. Pressurization unit
5. No. 10-24 X 3 1/2 machine screw
6. No. 10 lockwasher
7. 0.196-in. flat washer
8. Magnetron tuning drive

9. Captive screw
10. Flexible hose
11. Air duct assembly coupling
12. Air duct assembly
13. Flexible shaft
14. Knurled nut
15. Adapter
16. Toggle switch

Figure 46.1. Removal and installation of pressurization unit.

54. Air Duct Assembly

a. Removal.

- (1) Gain access to the rear of the receiver-transmitter enclosure (para 11.11.3).
- (2) Disconnect the air duct assembly

coupling (M, fig. 31); remove the mounting hardware (R, S, and T); and remove the air duct assembly (N).

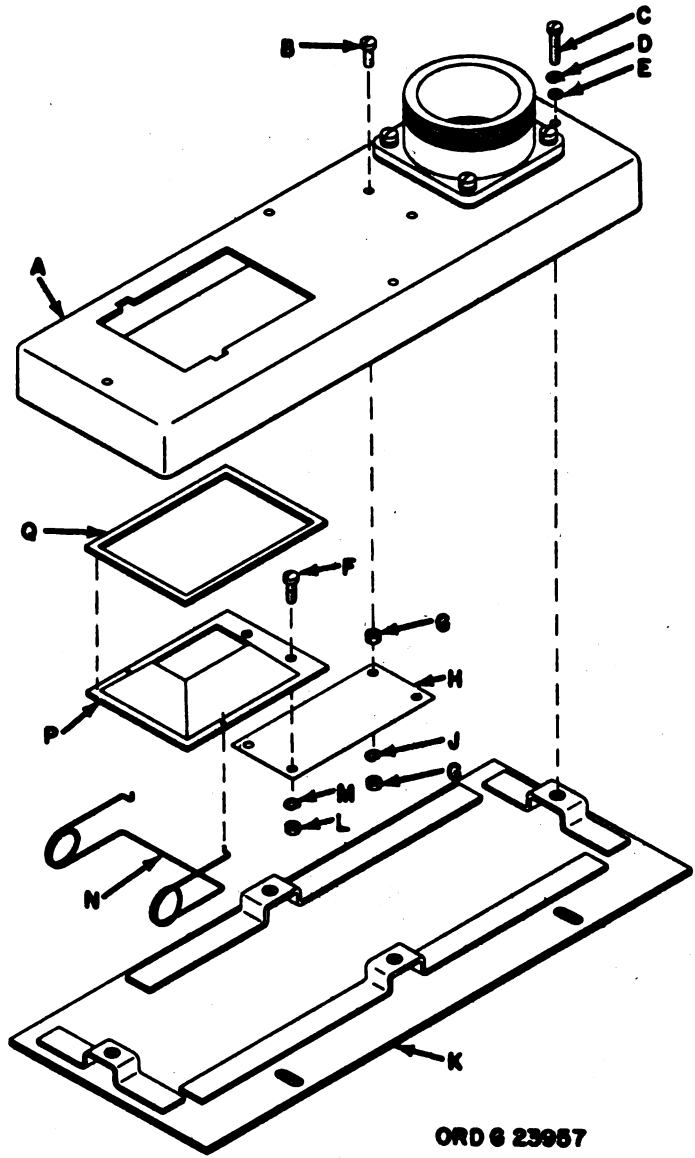
b. Disassembly. Disassemble the air duct assembly (fig. 46.2).

c. Assembly.

(1) Cement gasket (Q) to air guide (P) with polysulfide sealer compound 8030-631-5779.

(2) Assemble the air duct assembly (fig. 46.2).

d. Installation. Install the air duct assembly in the reverse order of removal, *a* above.



- A—Cover group
- B—No. 6-32 X $\frac{3}{4}$ pan-hd screw
- C—No. 6-32 X $\frac{3}{4}$ pan-hd screw
- D—No. 6 lockwasher
- F—0.156-in. flat washer
- F—No. 6-32 X $\frac{5}{16}$ pan-hd screw
- G—No. 6-32 hex nut
- H—Leaf spring

- J—No. 6 lockwasher
- K—Base
- L—No. 6-32 hex nut
- M—No. 6 lockwasher
- N—Torsion spring
- P—Air guide
- Q—Gasket

Figure 46.2. Air duct assembly—partially exploded view.

55. Housing Ground Connection (Typical)**a. Removal.**

(1) Gain access to the receiver-transmitter RF enclosure (para 11.11.3).

(2) Release two power supply clamps and position the RF control-power supply group as shown in figure 30.

(3) Remove the sealing compound (A, fig. 47), and then the housing ground connection.

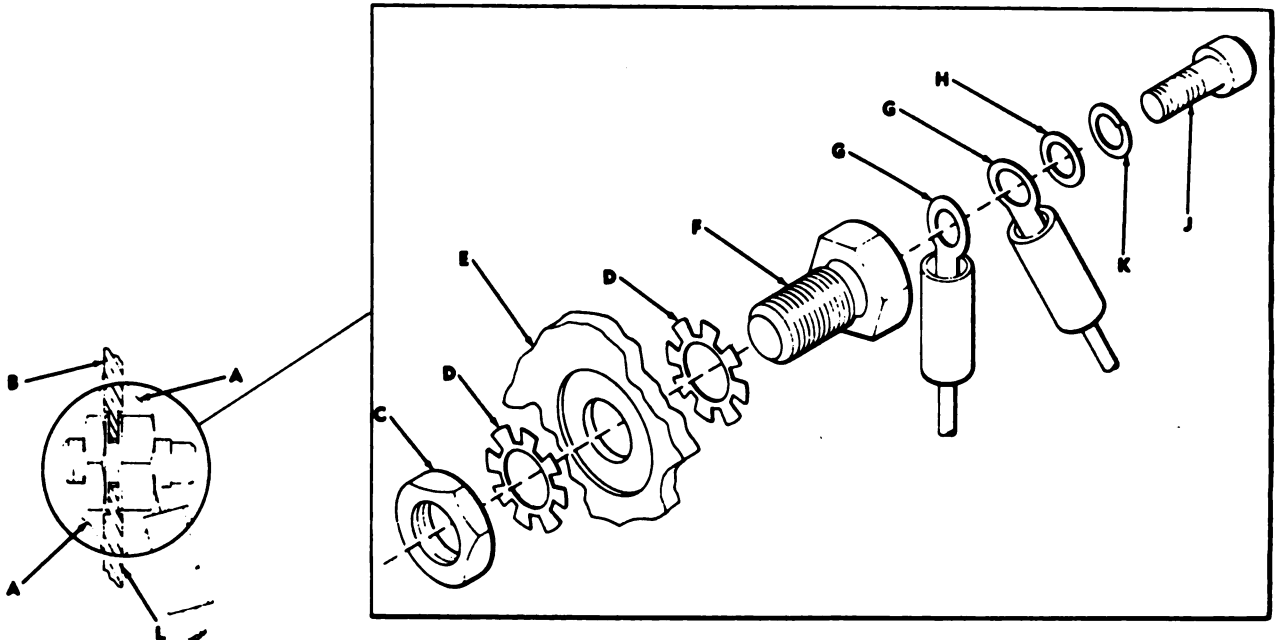
b. Installation.

(1) Thoroughly clean the surfaces of the housing where the ground connection will bear against it.

Note. The externally relieved body bolt and associated washers and nut are to be covered with sealing compound 8030-275-8110 as indicated by A, figure 47.

(2) Install the housing ground connection as indicated by figure 47.

(3) Return the equipment to normal operation (para 11.11.3).



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A—Sealing Compound
 B—Outside wall of receiver-transmitter housing
 C— $\frac{1}{16}$ -16 hex nut
 D— $\frac{3}{8}$ -in ext-tooth lockwasher
 E—Receiver-transmitter housing
 F—Exter-relieved body bolt

G—Leads
 H— $\frac{7}{32}$ -in. flat washer
 J—No. 10-24 X $\frac{1}{2}$ hex-socket-hd screw
 K—No. 10 lockwasher
 L—Inside wall of receiver-transmitter housing

Figure 47. Housing ground connection—typical.

CHAPTER 3.1 (Deleted)

NEXT NUMBERED PAGE IS 82.13

CHAPTER 3.2

MAINTENANCE OF RANGE RECEIVER-TRANSMITTER

Section I. AUTOMATIC CHANNEL SELECTION CIRCUITS

70.30. Driver Assembly

WARNING

The range receiver-transmitter contains voltages DANGEROUS TO LIFE. Gain access as specified in the procedures.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Gain access to the rear of the main RF enclosure (para 11.11.8).

(2) Disconnect connectors P68 from J11 (5, fig. 48.2), P57 from J25; P58 from J26, P79 from J27, P80 from J28, and P56 from J29 (1).

(3) Release the turnlock fastener, and remove driver assembly (2).

b. Installation.

(1) Install the driver assembly in the reverse order of removal, *a* above.

(2) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 8).

70.31. Remote Switching Control

WARNING

The range receiver-transmitter contains voltages DANGEROUS TO LIFE. Gain access as specified in the procedures.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Remove driver assembly (para 70.80a).

(2) Disconnect connector P35 (4, fig. 48.2) from J1.

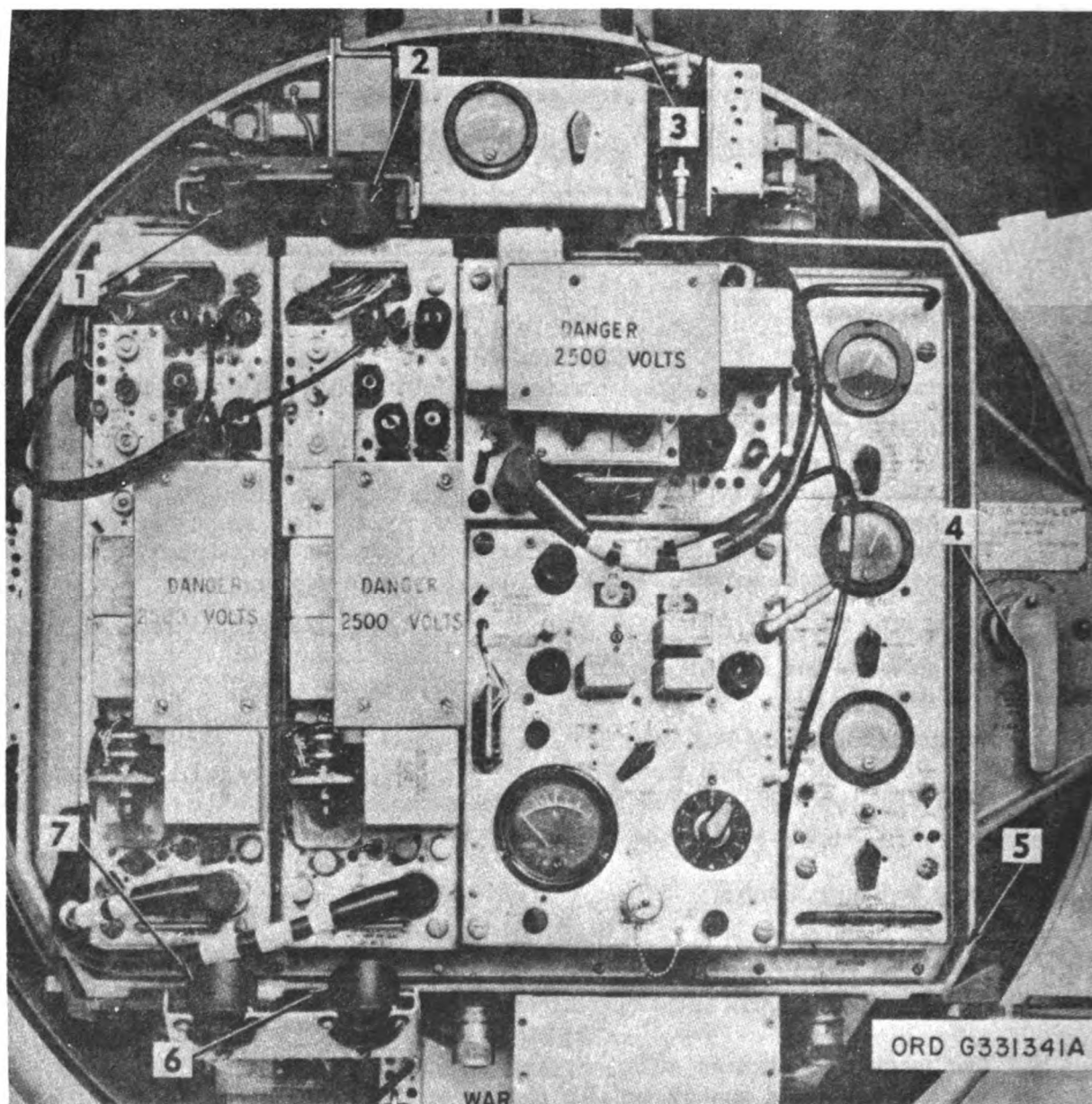
(3) Remove two pan-head screws, lock-washers, and flat washers (1, 2, and 3, fig. 48.3).

(4) Loosen captive screw, and remove remote switching control.

b. Installation.

(1) Install the remote switching control in the reverse order of removal, *a* above.

(2) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 8).



- | | |
|----------------------|--|
| 1. Vaneaxial fan B2 | 5. Range RF control-power supply group |
| 2. Vaneaxial fan B1 | 6. Vaneaxial fan B8 |
| 3. Vaneaxial fan B11 | 7. Vaneaxial fan B4 |
| 4. Release handle | |

Figure 48.1. Range receiver-transmitter—interior view.

70.32. Logic Assembly

WARNING

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Gain access as specified in the procedures.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Gain access to the rear of the main RF enclosure (para 11.11.8).

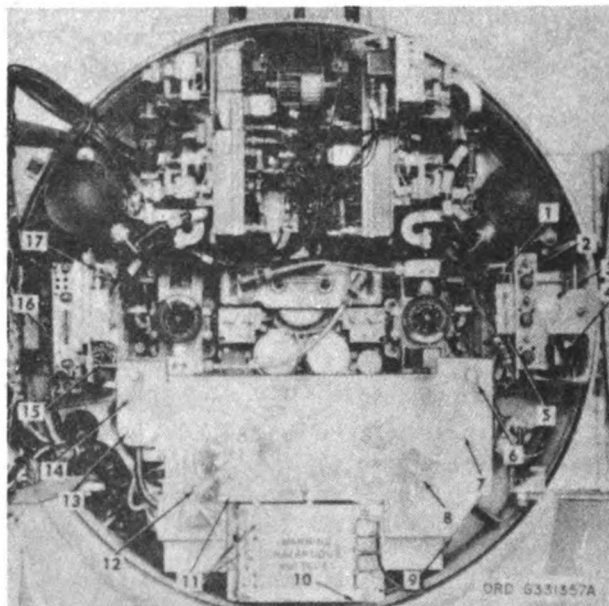
(2) Disconnect connectors P62 from J10 (15, fig. 48.2), P26 from J19, P60 from J20, P54 from J21, and P61 from J22 (17).

(3) Release the turnlock fastener, and remove the logic assembly (16).

b. Installation.

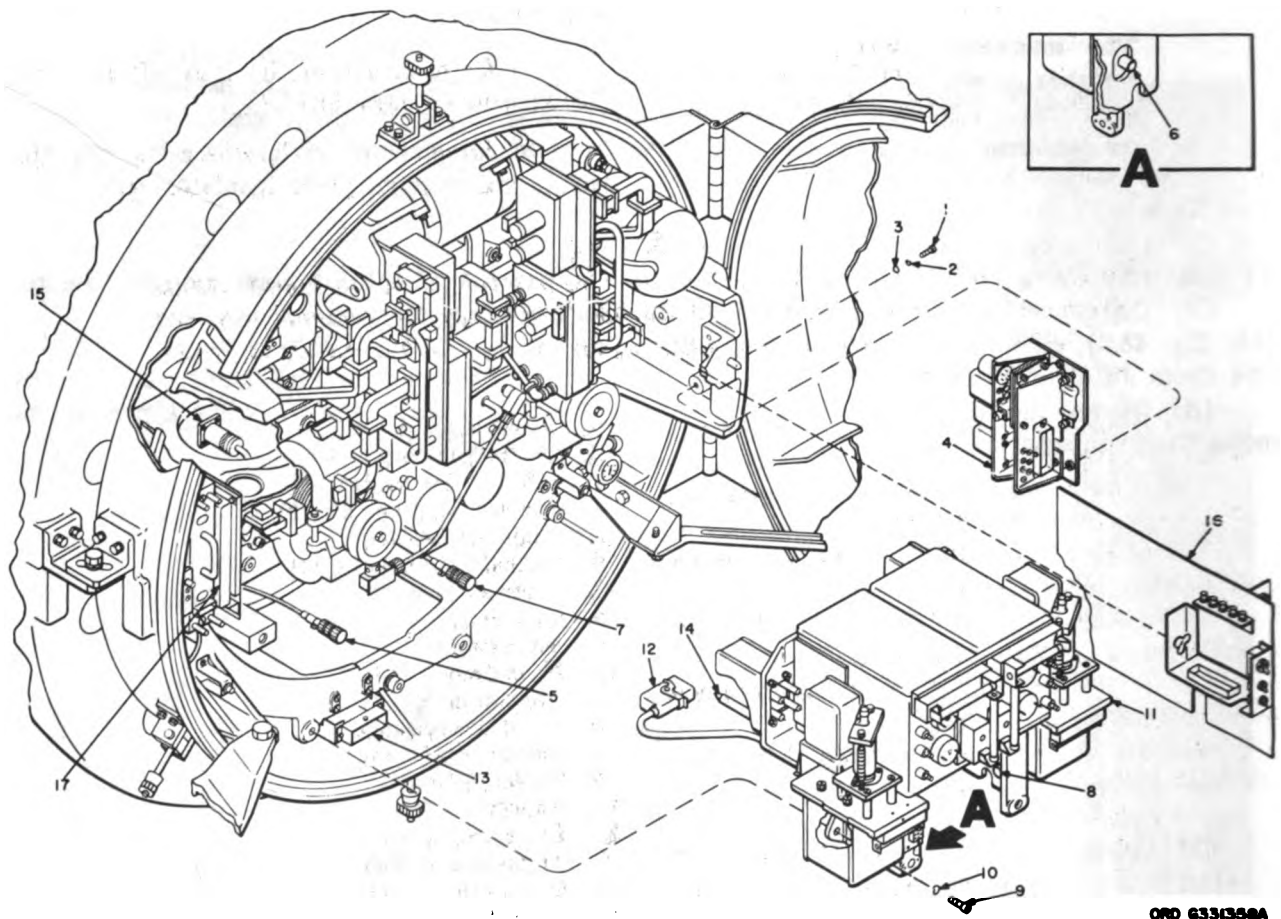
(1) Install the logic assembly in the reverse order of removal, *a* above.

(2) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 8).



1. Connectors J25-J29
2. Driver assembly
3. Remote switching control
4. Connector P85
5. Connector J11
6. Thumbscrew (6)
7. Electron tube V6 cap lead
8. Magnetron B transformer leads
9. Plate insulator
10. Range pulse generator
11. Modulator subassembly
12. Magnetron A transformer leads
13. Electron tube V2 cap lead
14. Electron tube V1 cap lead
15. Connector P10
16. Logic assembly
17. Connectors J19-J22

Figure 48.2. Range receiver-transmitter—interior view.



- | | |
|--|-----------------------------|
| 1. No. 10-24 x 1 pan-hd screw (2) | 10. 5/16-in. lockwasher (4) |
| 2. No. 10 lockwasher (2) | 11. Modular subassembly |
| 3. 0.216-in. flat washer (2) | 12. Connector P1 |
| 4. Remote switching control | 13. Connector J5 |
| 5. Connector P29 | 14. Guide pin (2) |
| 6. L1 connector | 15. Connectors J25 and J6 |
| 7. Connector P80 | 16. Driver assembly |
| 8. L2 connector | 17. Logic assembly |
| 9. 5/16-18 x 1 hex-socket-hd screw (4) | |

Figure 48.3. Range receiver-transmitter—partially exploded view.

Section II. TUNING CIRCUITS

70.33. Flexible Shaft Assembly and Associated Parts

WARNING

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Gain access as specified in the procedures.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

NOTE

The instructions in this paragraph apply equally to the two flexible shaft assemblies (12 and 18, fig. 48.4). The instructions are written for the magnetron B flexible shaft assembly.

a. Removal.

- (1) Gain access to the rear of the main RF enclosure (para 11.11.8).
- (2) Remove five thumbscrews (6, fig. 48.2), and remove plate insulator (9).

WARNING

Voltages **DANGEROUS TO LIFE** may be present with the power turned off. Using a shorting device with an insulated handle, momentarily connect each exposed electrical contact in the modular subassembly to ground before proceeding.

(3) Record the indication of magnetron B dial (10, fig. 48.4).

(4) Loosen two knurled coupling nuts (4), and remove flexible shaft assembly (12).

(5) Loosen hexagon coupling nut (16), and remove offset coupling (18).

(6) Loosen two captive screws (7), and remove angle bracket assembly (5).

(7) Loosen two setscrews (9), and remove gear assembly (8).

b. Disassembly of Gear Assembly. Disassemble gear assembly (fig. 48.5).

c. Assembly.

(1) Drive two spring pins (15, fig. 48.5) into cover (7) until the spring pins extend into the cover between 13/64 and 19/64 inch.

1. 1/4-20 hex nut (4)
2. 1/4-in. lockwasher (4)
3. 0.281-in. flat washer (4)
4. Knurled coupling nuts (2)
5. Angle bracket assy
6. Manual adjustment shaft
7. Captive screw (2)
8. Gear assy
9. Setscrew (2)
10. Magnetron B dial
11. Magnetron B
12. Flexible shaft assy
13. Flexible shaft assy
14. Tuning drive
15. Handle
16. Hex coupling nut
17. Angle bracket assy
18. Offset coupling (2)
19. Magnetron A dial

Figure 48.4—Continued.

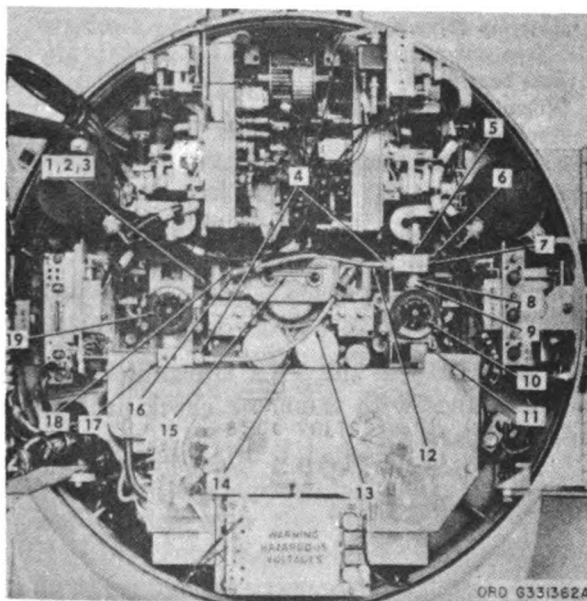


Figure 48.4. Range receiver-transmitter—interior view.

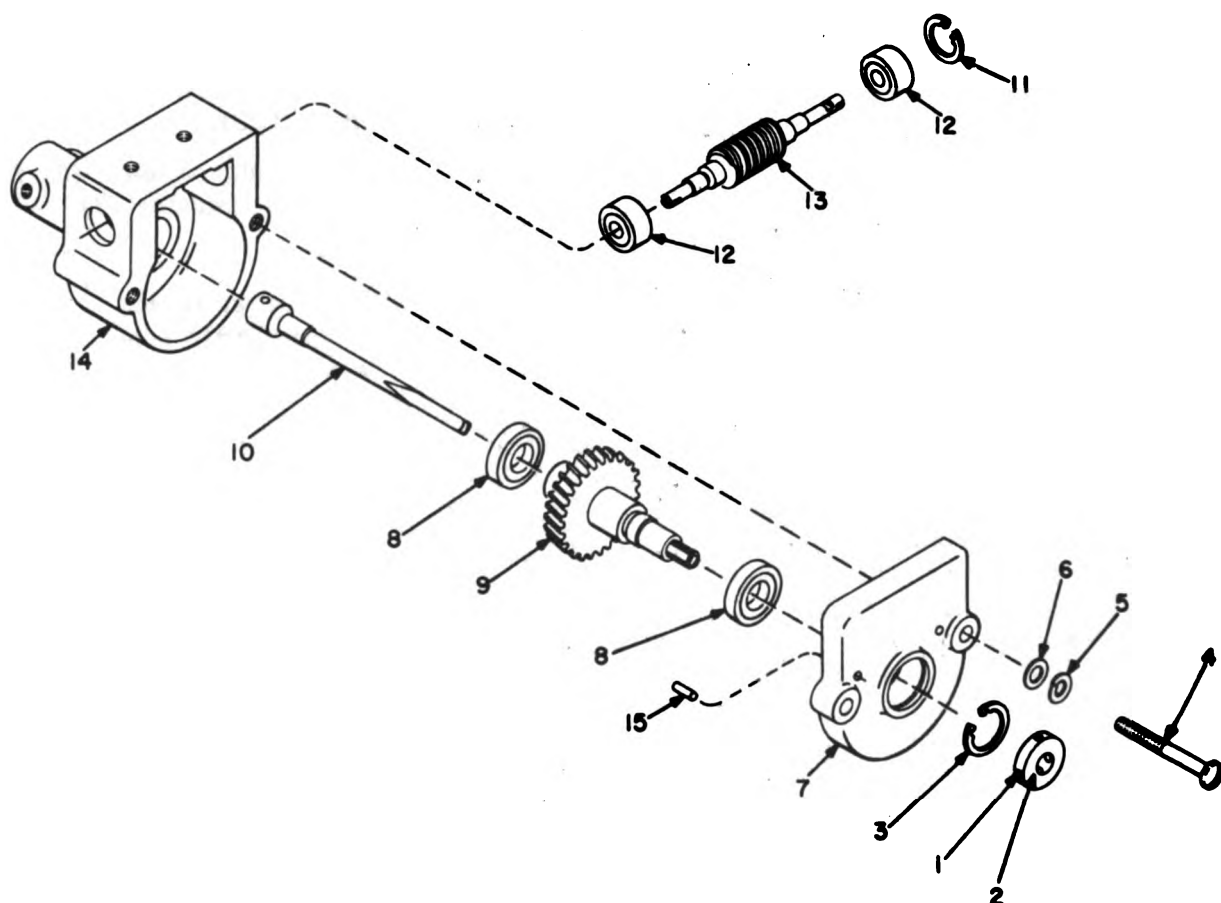
(2) Install worm shaft (18) in housing (14).

(3) Assemble the gearshaft (9), ball bearings (8), and flexible drive shaft (10). Install the assembly in the housing (14). Secure cover (7) with two flatwashers, lockwashers and pan-head screws (6, 5, and 4); install retaining ring (8).

(4) Slide bushing clamp (2) onto end of gearshaft (9). Adjust flexible drive shaft (10) to obtain a clearance between the end of the shaft and the housing of between 0.276 and 0.286 inch; tighten four setscrews (1, fig. 48.5).

d. Installation.

(1) Install gear assembly (8, fig. 48.4) on magnetron B (11), and secure two setscrews (9).



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- | | |
|------------------------------|----------------------------------|
| 1. Setscrew (4) | 9. Gearshaft |
| 2. Bushing clamp | 10. Flexible drive shaft |
| 3. 1/2-in. int retn ring | 11. 1/2-in. int retn ring |
| 4. No. 6-32 x 1 pan-hd screw | 12. Ball bearing |
| 5. No. 6 lockwasher (2) | 13. Worm shaft |
| 6. 0.156-in. flat washer (2) | 14. Housing |
| 7. Cover | 15. 0.062 x 0.312 spring pin (2) |
| 8. Ball bearing (2) | |

Figure 48.5. Gear assembly—exploded view.

(2) Install angle bracket assembly (5) on gear assembly (8), and tighten two captive screws (7).

(3) Install offset coupling (18) on tuning drive (14), and secure hexagon coupling nut (16).

(4) Check that the indication on magnetron B dial (10) has not changed from the indication recorded in a (3) above. If the indication has changed, turn manual adjustment shaft (6) to obtain the recorded indication on magnetron B dial.

(5) Complete installation in the reverse order of removal, a (4) through (1) above.

(6) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 8).

70.34. Tuning Drive

a. Removal.

(1) Energize the target ranging radar system transmitter, and tune both magnetrons to upper frequency limit F5; then deenergize

transmitter in accordance with the operator and organizational maintenance manual (para 8). Allow sufficient time for the magnetrons to cool.

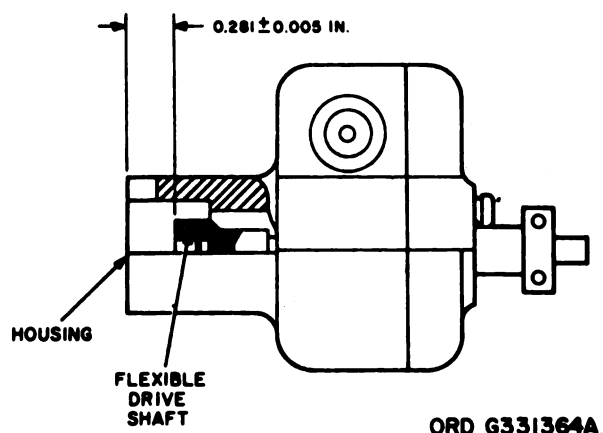


Figure 48.6. Adjustment of flexible drive shaft.

WARNING

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

(2) Remove the two flexible shaft assemblies (12 and 18, fig. 48.4) in accordance with para 70.83a (1) through (4).

(3) Remove four hexagon nuts (1), lockwashers (2), and flat washers (3). Grasp handle (15), and remove tuning drive (14).

b. Installation.

(1) Install tuning drive (14, fig. 48.4) in range receiver-transmitter. Secure tuning drive with four flat washers (3), lockwashers (2), and hexagon nuts (1).

(2) Install offset coupling (18) on tuning drive, and secure hexagon coupling nut (16). Install flexible shaft assembly (12), and secure two knurled coupling nuts (4).

(3) Install second offset coupling and flexible shaft assembly (18) by following procedure similar to b (1) and (2) above.

(4) Install plate insulator (9, fig. 48.2), and secure with five thumbscrews (6).

(5) Tune the target ranging radar system to the upper frequency limit (F5) in accordance with the operator and organizational

maintenance manual (para 8). If magnetron B dial (10, fig. 48.4) does not indicate a value corresponding to upper frequency limit F5 (stamped on the magnetron) when range receiver-transmitter is tuned to maximum frequency, deenergize transmitter; loosen knurled coupling nut (4); disconnect flexible shaft assembly from offset coupling (18); and turn manual adjustment shaft (6) until magnetron B dial indicates a value corresponding to F5 stamping. Connect flexible shaft assembly to offset coupling, and secure knurled coupling nut. Perform procedure similar to above for adjustment of magnetron A dial (19).

(6) Secure the main RF enclosure (para 11.11.3c).

(7) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 8).

Section III. RANGE TRANSMITTER AND ASSOCIATED CIRCUITS

70.35. Range Pulse Generator

WARNING

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Gain access as specified in the procedures.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Gain access to the rear of the main RF enclosure (para 11.11.3).

(2) Disconnect connectors P5 from J1, P68 from J2, P67 from J8, P55 from J4, P4 from J5, and P6 from J6.

(3) Release the turnlock fasteners, and remove the range pulse generator (10, fig. 48.2).

b. Installation.

(1) Install the range pulse generator in the reverse order of removal, *a* above.

(2) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 8).

70.36. Modulator Subassembly

WARNING

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Set TRR POWER switch on range power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Remove the range pulse generator (para 70.35a).

(2) Remove five thumbcrews (6, fig. 48.2), and remove plate insulator (9).

WARNING

Voltages **DANGEROUS TO LIFE** may be present with the power turned off. Using a shorting device with an insulated handle, momentarily connect each exposed electrical contact in the modulator subassembly to ground before proceeding.

(3) Disconnect the cap leads (7 and 14) from tubes V6 and V1.

(4) Tag and disconnect the transformer leads (8 and 12) for magnetrons B and A.

(5) Disconnect connectors P29 (5, fig. 48.3) from L1 (6) and P30 (7) from L2 (8)

(6) Remove four hexagon-head screws and lockwashers (9 and 10).

(7) Disconnect connector P1 (12) from J5 and remove the modulator subassembly.

b. Installation.

(1) Install the modulator subassembly in the reverse order of removal, *a* above.

(2) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 8).

70.37. Reactor L1 or L2**WARNING**

The range receiver-transmitter contains voltages DANGEROUS TO LIFE. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Remove the modulator subassembly (para 7-36a).

(2) Disconnect the external lead from reactor L1 (4, fig. 48.7) or L2 (19), and remove the reactor.

b. Installation.

(1) Install the reactor in the modulator subassembly, and connect the external lead.

(2) Install the modulator subassembly (para 70.86b).

70.38. Pulse Forming Network Z1 or Z2**WARNING**

The range receiver-transmitter contains voltages DANGEROUS TO LIFE. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Remove the modulator subassembly (para 70.86a).

(2) Disconnect and tag the external leads from pulse forming network Z1 (20, fig. 48.7) or Z2 (11), as applicable.

(3) Remove four pan-head screws and lockwashers (5 and 6). Move resistor assembly (7) away from Z1 and Z2.

(4) Remove Z1 or Z2 from the modulator subassembly.

b. Installation.

(1) Install the pulse forming network in the reverse order of removal, *a* above.

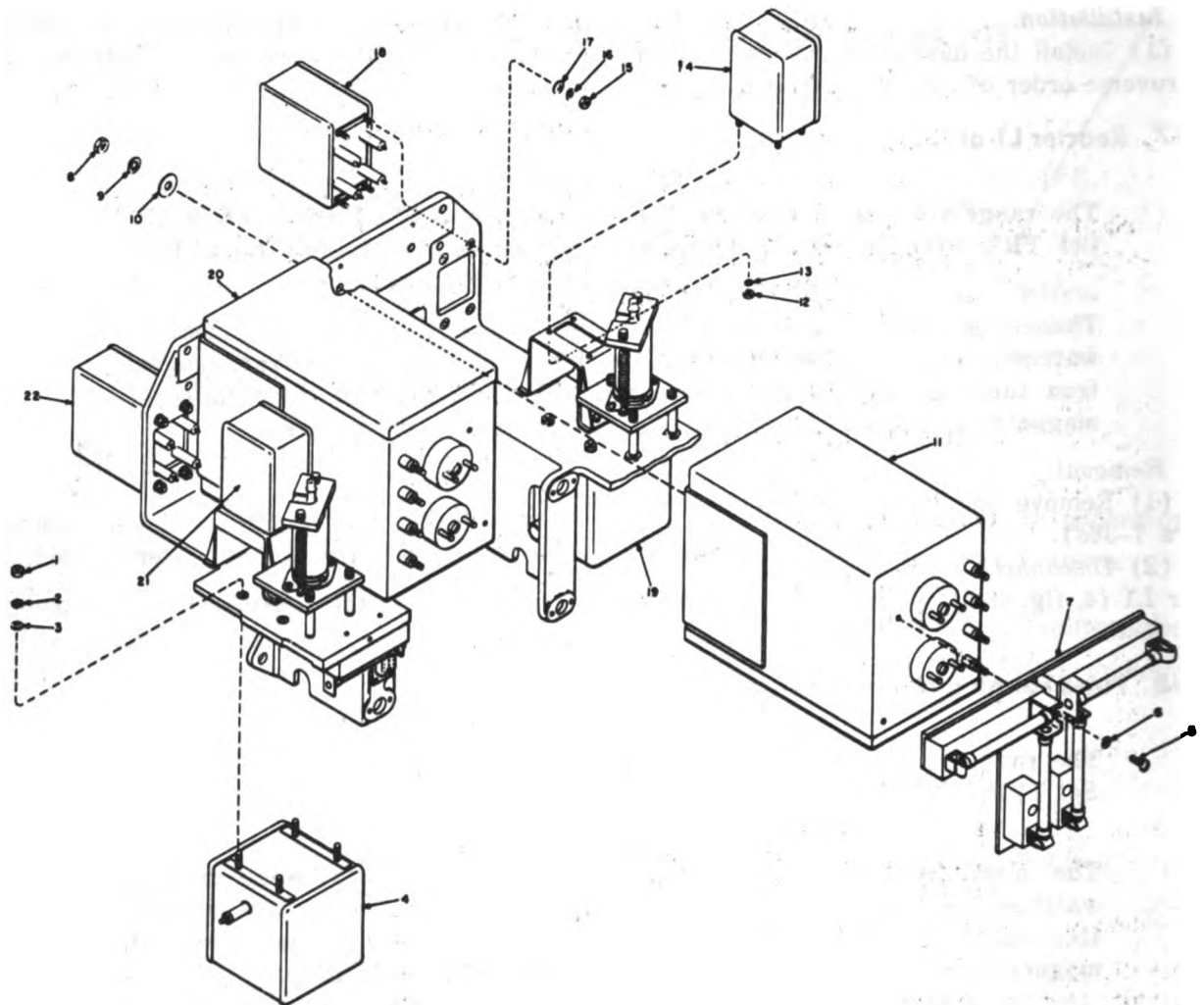
(2) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 8).

70.39. Transformer T2, T3, T4, or T5**WARNING**

The range receiver-transmitter contains voltages DANGEROUS TO LIFE. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.



GPO 453-12224

- | | |
|-------------------------------------|------------------------------|
| 1. No. 10-24 hex nut (4) | 12. No. 6-32 hex nut (4) |
| 2. No. 10 lockwasher (4) | 13. No. 6 lockwasher (4) |
| 3. 0.25-in. flat washer (4) | 14. Transformer T5 |
| 4. Reactor L1 | 15. No. 10-32 hex nut (4) |
| 5. No. 8-32 x 5/16 pan-hd screw (4) | 16. No. 10 lockwasher (4) |
| 6. No. 6 lockwasher (4) | 17. 0.25-in. flat washer (4) |
| 7. Resistor assy | 18. Transformer T4 |
| 8. 5/16-24 hex nut (4) | 19. Reactor L2 |
| 9. 5/16-in. lockwasher (4) | 20. Pulse forming network Z1 |
| 10. 0.375-in. flat washer (4) | 21. Transformer T3 |
| 11. Pulse forming network Z2 | 22. Transformer T2 |

Figure 48.7. Modulator subassembly—partially exploded view.

a. Removal.

(1) Remove modulator subassembly (para 70.86a).

(2) Disconnect and tag the external leads from transformer T2 (22, fig. 48.7), T3 (21), T4 (18), or T5 (14), and remove the transformer.

62.22

b. Installation.

(1) Install the transformer in the reverse order of removal, *a* above.

(2) Perform the transmitter checks in accordance with the track check procedures manual (para 8).

70.40. Electron Tube Retainer (V2)**WARNING**

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Remove the modulator subassembly (para 70.36a).

(2) Disconnect cap lead (13, fig. 48.2) from electron tube V2, and remove V2.

(3) Remove three pan-head screws, lock-washers, flat washers and bushing insulators (2, 3, 4, and 5, fig. 48.8).

(4) Disconnect and tag the leads from electron tube retainer (6), and remove the retainer.

b. Disassembly and Assembly. Disassemble and assemble electron tube retainer (6).

c. Installation.

(1) Install three standoff insulators (11) on modulator subassembly.

(2) Install the electron tube retainer in the reverse order of removal, *a* above.

(3) Perform the target ranging radar system transmitter checks in accordance with the track check procedures manual (para 3).

70.41. Transformer T7 or T8**WARNING**

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Remove the modulator subassembly (para 70.36a).

(2) Disconnect and tag external leads from transformer T7 (8, fig. 48.9) or T8 (6).

(3) Remove the mounting bracket (5), and remove the transformer from the bracket.

b. Installation.

(1) Install the transformer in the reverse order of removal, *a* above.

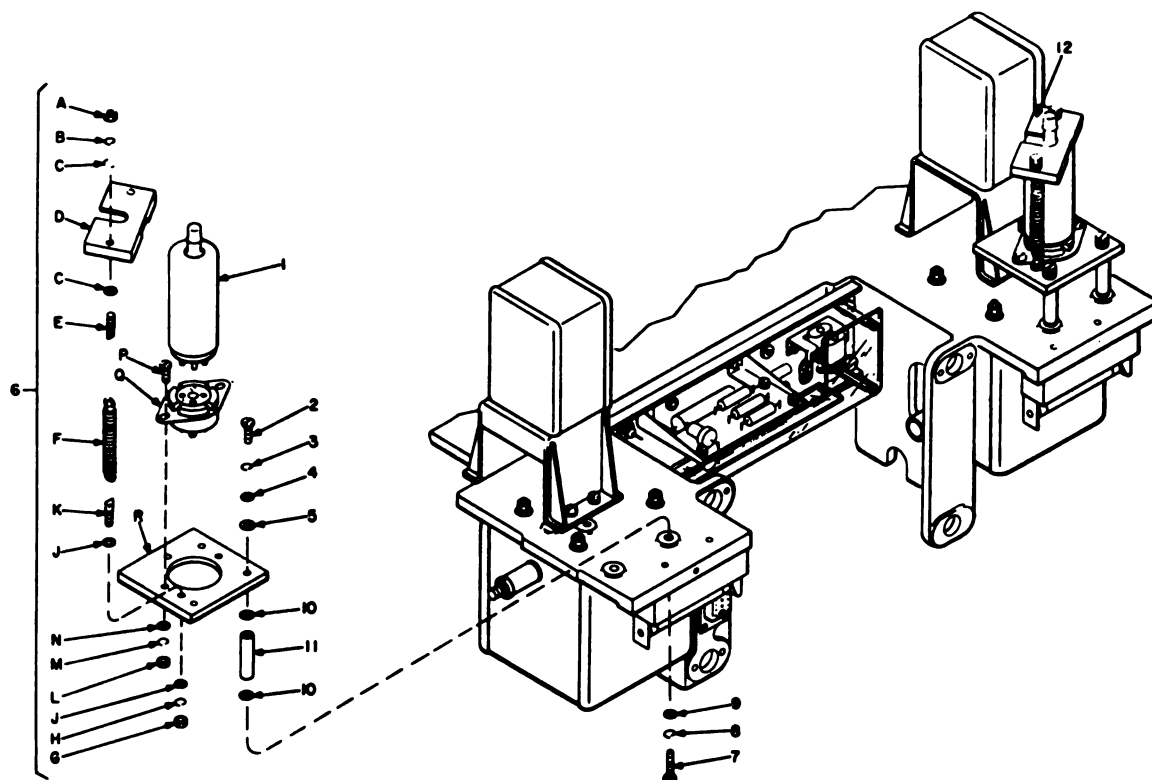
(2) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 3).

70.42. Tube Socket XV1**WARNING**

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.



ORD 6331360A

1. Electron tube V2
2. No. 8-32 x 1/2 pan-hd screw (3)
3. No. 6 lockwasher (3)
4. No. 6 flat washer (3)
5. Bushing insulator (3)
6. Electron tube retainer (2)
 - A—No. 6-32 hex nut (2)
 - B—No. 6 lockwasher (2)
 - C—5/82-in. flat washer (2)
 - D—Retainer plate
 - E—Eye bolt (2)
 - F—Spring
 - G—No. 6-32 hex nut (2)
 - H—No. 6 lockwasher (2)

- J—5/82-in. flat washer (2)
 - K—Eye bolt (2)
 - L—No. 6-32 hex nut (2)
 - M—No. 6 lockwasher (2)
 - N—5/82-in. flat washer (2)
 - P—No. 6-32 x 1/2 pan-hd screw
 - Q—Socket
 - R—Mounting plate
7. No. 7-32 x 3/4 pan-hd screw (3)
 8. No. 6 lockwasher (3)
 9. 0.156-in. flat washer (3)
 10. Bushing insulator (6)
 11. Standoff insulator (3)
 12. Electron tube retainer

**Figure 48.8. Modulator subassembly—
partially exploded view.**

a. Removal.

(1) Remove the modulator subassembly (para 70.36a).

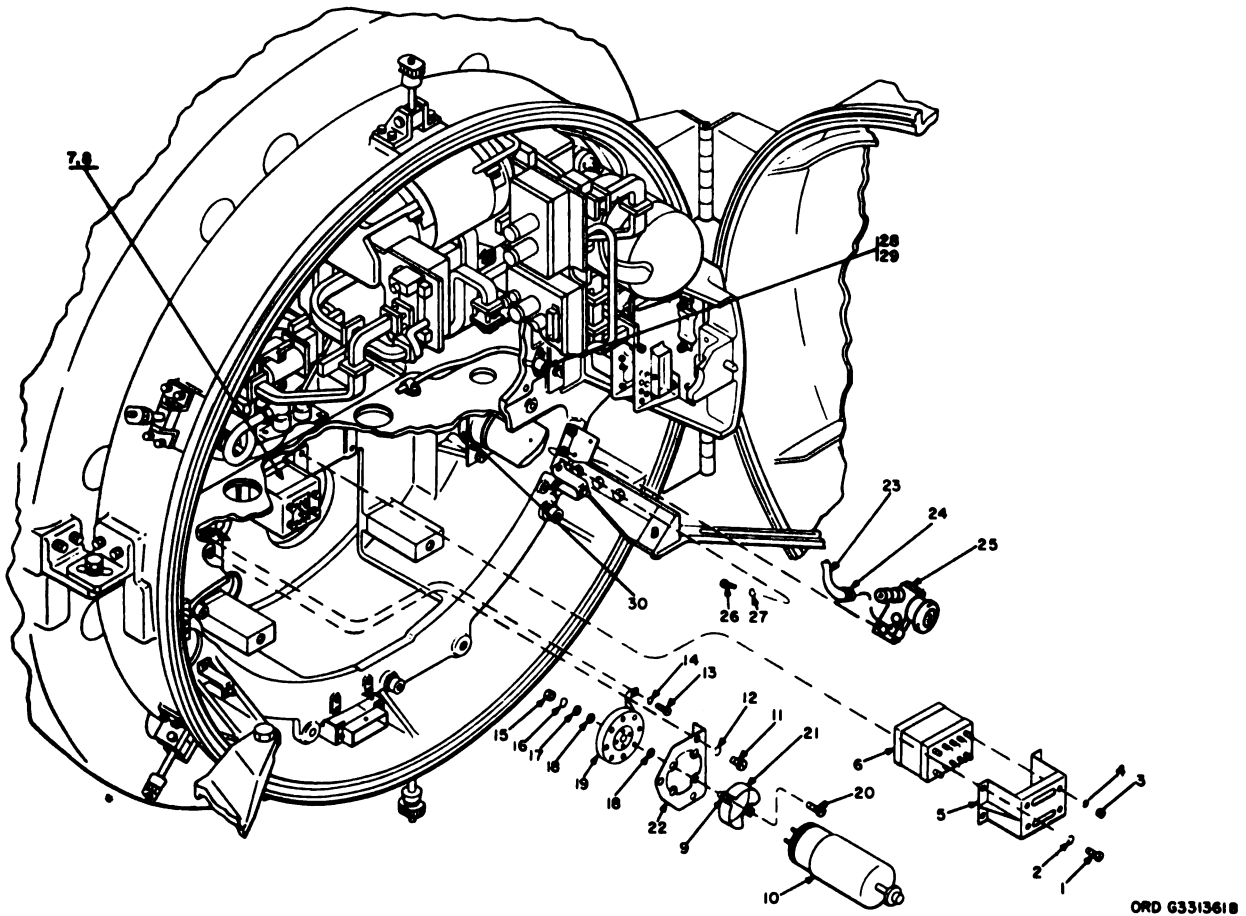
(2) Loosen retaining clamp (9, fig. 48.9), and remove electron tube (10).

(3) Remove three pan-head screws and lockwashers (11 and 12).

(4) Remove pan-head screw and lockwasher (13 and 14).

(5) Disconnect and tag the leads from socket XV1 (19).

(6) Remove socket XV1 with attached electron tube retainer (21) from electrical components bracket (22).



ORD G331361B

- 1—No. 10-24 x 3/8 pan-hd screw (4)
- 2—No. 10 lockwasher (4)
- 3—No. 6-32 hex nut (4)
- 4—No. 6 lockwasher (4)
- 5—Mounting bracket
- 6—Transformer T8
- 7—Mounting bracket
- 8—Transformer T7
- 9—Retainer clamp
- 10—Electron tube
- 11—No. 10-24 x 3/8 pan-hd screw (3)
- 12—No. 10 lockwasher (3)
- 13—No. 6-32 x 3/8 pan-hd screw
- 14—No. 6 lockwasher
- 15—No. 8-32 hex nut (4)

- 16—No. 8 lockwasher (4)
- 17—0.187-in. flat washer (4)
- 18—Nonmetallic washer (8)
- 19—Socket XV1
- 20—No. 8-32 x 5/8 pan-hd screw (4)
- 21—Electron tube retainer
- 22—Electrical components bracket
- 23—Nonmetallic hose
- 24—Hose connector
- 25—Bleed-check valve assembly
- 26—No. 8-32 x 5/8 pan-hd screw (2)
- 27—No. 8 lockwasher (2)
- 28—Preformed packing
- 29—Plug
- 30—Socket XV6

Figure 48.9. Range receiver-transmitter — partially exploded view.

b. Installation.

- (1) Install the tube socket in the reverse order of removal, *a* above.

- (2) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 3).

70.43. Bleed Check Valve and Associated Parts**WARNING**

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Gain access as specified in the procedures.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Gain access to the rear of the main RF enclosure (para 11.11.3).

(2) Remove five thumbscrews (6, fig. 48.2), and remove insulator (9).

WARNING

Voltages **DANGEROUS TO LIFE** may be present with the power turned off. Using a shorting device with an insulated handle, momentarily connect each exposed electrical contact in the modulator subassembly to ground before proceeding.

(3) Remove nonmetallic hose (23, fig. 48.9) and hose connector (24) from bleed-check valve assembly (25).

(4) Remove two pan-head screws and lockwashers (26 and 27).

(5) Remove bleed-check valve assembly (25) from range receiver-transmitter.

b. Installation.

(1) Install the bleed-check valve in the reverse order of removal, *a* above.

(2) Perform the waveguide pressurization check in accordance with the check procedures manual (para 3). If the unit fails to pass the check, apply a small amount of soap and water to the base connections; pressurize the system; and check for air leaks.

NOTE

Do not secure the RF enclosure until performing (2) below.

70.44. Transformer T1 or T6**WARNING**

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

NOTE

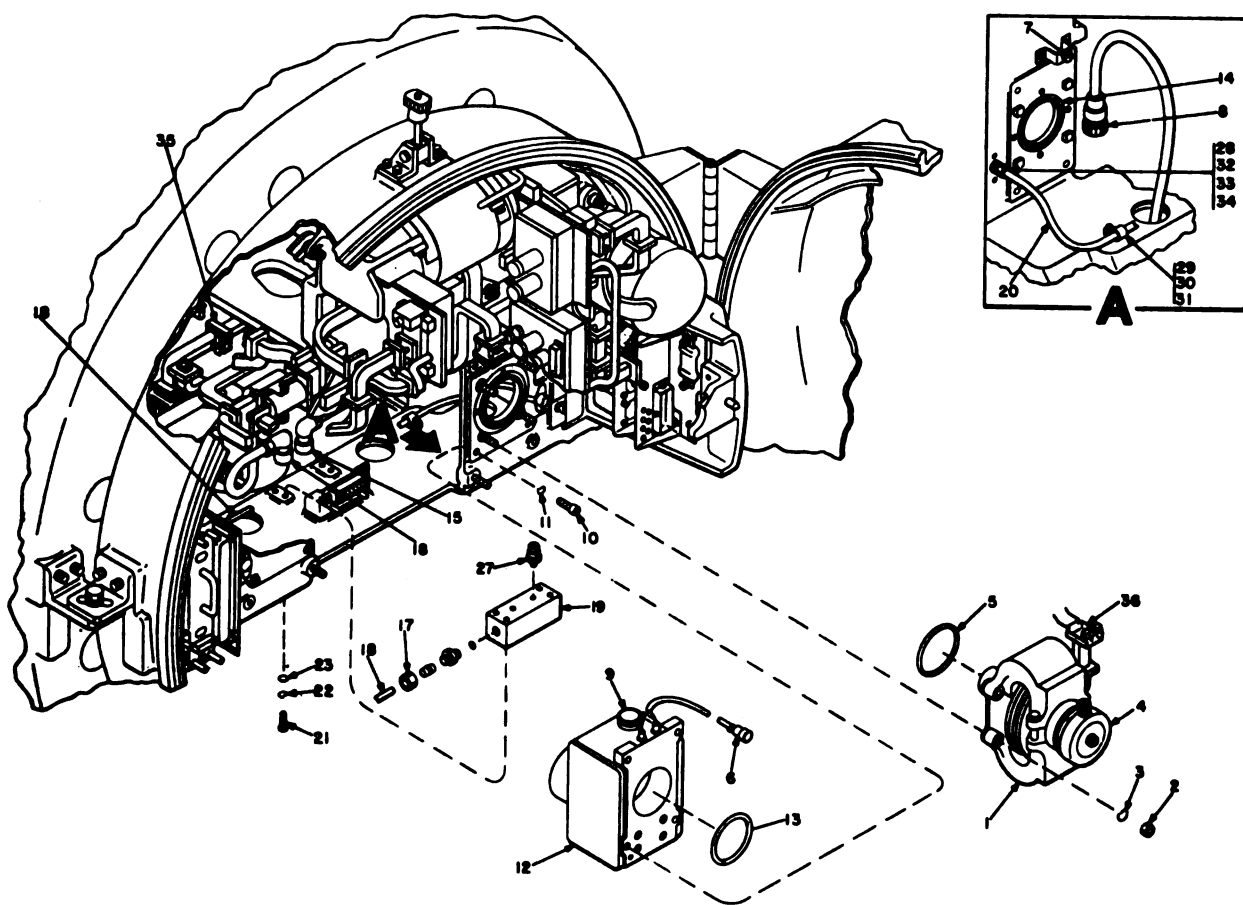
Procedures for removal and installation of transformer T1, located behind magnetron A, are identical to instructions for removal and installation of trans-

former T6 except for location of parts and connectors to be disconnected and connected. Substitute connectors P8, P86, and J6 for P7, P37, and J7, respectively, when removing and installing T1.

a. Removal.

(1) Remove the tuning drive (para 70.34a) but do not remove the offset couplings (18, fig. 48.4) from the tuning drive.

(2) Disconnect waveguide coupling (36, fig. 48.10).



ORD 6331348A

- 1—Lower magnet
- 2—5/16-24 hex nut (4)
- 3—5/16-in. lockwasher (4)
- 4—Magnetron group
- 5—Preformed packing
- 6—Connector P37
- 7—Connector J7
- 8—Connector P7
- 9—Transformer connector
- 10—5/16-18 x 7/8 hex-socket-hd screw (8)
- 11—No. 6 lockwasher (4)
- 12—Transformer T6
- 13—Preformed packing 9187278
- 14—Groove
- 15—Compressor hose coupling
- 16—Waveguide switch hose coupling
- 17—Coupling nut (2)
- 18—Tube

- 19—Airline manifold
- 20—Tube
- 21—No. 8-32 x 3/4 pan-hd screw (4)
- 22—No. 8 lockwasher (4)
- 23—0.187-in. flat washer (4)
- 24—Coupling sleeve (2)
- 25—Union (2)
- 26—Preformed packing (2)
- 27—Coupling (2)
- 28—Coupling nut (2)
- 29—No. 8-32 x 3/8 pan-hd screw
- 30—No. 8 lockwasher
- 31—Clamp
- 32—Coupling sleeve (2)
- 33—Union (2)
- 34—Preformed packing (2)
- 35—Waveguide coupling
- 36—Waveguide coupling

Figure 48.10. Range receiver—partially exploded view.

CAUTION

Avoid strain on the glass stem of the magnetron tube by supporting the lower magnet while removing the tube group and mounting hardware.

- (3) Support the lower magnet (1), and remove four hexagon nuts and lockwashers (2 and 3). Carefully remove magnetron group (4) straight forward to avoid damage.
- (4) Inspect preformed packing (5); remove if pinched, displaced, or damaged.
- (5) Disconnect connectors P37 (6) from J7 (7), and P7 (8) from transformer connector (9).
- (6) Remove transformer T6 (12) with leads attached.
- (7) Disconnect and tag leads associated with connector P37 from T6.
- (8) Inspect preformed packing (13); remove if pinched, displaced, or damaged.

*b. Installation.***CAUTION**

Avoid strain on the glass stem of the magnetron tube, or undue strain on the magnetron tube group, when installing and connecting the magnetron tube group. Support the lower magnet (1), and assure that the waveguide flanges meet when installing the magnetron tube group.

NOTE

Install new preformed packing (13 and 5) as necessary.

- (1) Install the transformer in the reverse order of removal, *a* above.

- (2) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 3).

Section IV. RECEIVING CIRCUITS**70.45. Range A or Range B Frequency Mixer Group****WARNING**

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

NOTE

The following procedure, written for the range A frequency mixer group, is equally applicable to the range B frequency mixer group.

a. Removal

- (1) Remove the reflector assembly in accordance with the assembly and emplacement manual (para 3).

- (2) Remove the tuning drive (para 70.34a), but do not remove offset couplings (18, fig. 48.4) from the tuning drive.

- (3) Disconnect the applicable connectors as indicated:

(a) For either mixer group, disconnect P18 and P19 from J1 and J2 on the panoramic range IF preamplifier (6, fig. 48.11).

(b) For the range A mixer group, disconnect as listed (fig. 48.11):

Chassis	Fig. ref.	Connectors
Mixer	1	P69 and J1 P70 and J2
AFC IF preamplifier	2	P17 and J1 P16 and J2 P15 and J5 P14 and J4
IF preamplifier 5		P13 and J1 P12 and J2

(c) For the range B mixer group, disconnect as listed (fig. 48.11):

Chassis	Fig. ref.	Connectors
Mixer	14	P71 and J1 P72 and J2
AFC IF preamplifier	13	P25 and J1 P24 and J2 P23 and J5 P22 and J6
IF preamplifier 10		P21 and J1 P20 and J2
RF switch	9	P18 and A P77 and B P8 and 1 P34 and 2 P40 and C P42 and J1

(4) Disconnect and tag the leads from range A mixer terminal E4 (3, fig. 48.11), panoramic mixer terminal E2 (8), and range B mixer terminal E3 (12).

(5) Disconnect terminals 11, 12, 13, and 14 from the spade side of TB2.

(6) Remove the cover, and unplug the tuning switch driver (11); remove connector J13.

(7) Disconnect range A mixer and range B mixer hose couplings (16, fig. 48.10) from airline manifold (19).

(8) Disconnect four waveguide couplings (15, 17, 19, and 20, fig. 48.11).

(9) Disconnect connectors P29, P27, and P9 (1, 23, and 24, fig. 48.12) from backward-wave oscillators (7, 16, and 18, fig. 48.11), respectively.

(10) Disconnect waveguide couplings (35, fig. 48.10).

(11) Disconnect connector P33 (2, fig. 48.12) from connector J12 (3) on ferrite switch mounting bracket (4).

(12) Disconnect hose couplings (15) from airline manifold (16).

(13) Loosen three pan-head screws (5), and slide target range receiver-transmitter waveguide assembly group (6) slightly to the left to clear waveguide couplings (35, fig. 48.10).

(14) Remove four pan-head screws, lockwashers, and flat washers (7, 8, and 9, fig. 48.12).

(15) Remove four hexagon-socket-head screws, lockwashers, and flat washers (10, 11 and 12).

CAUTION

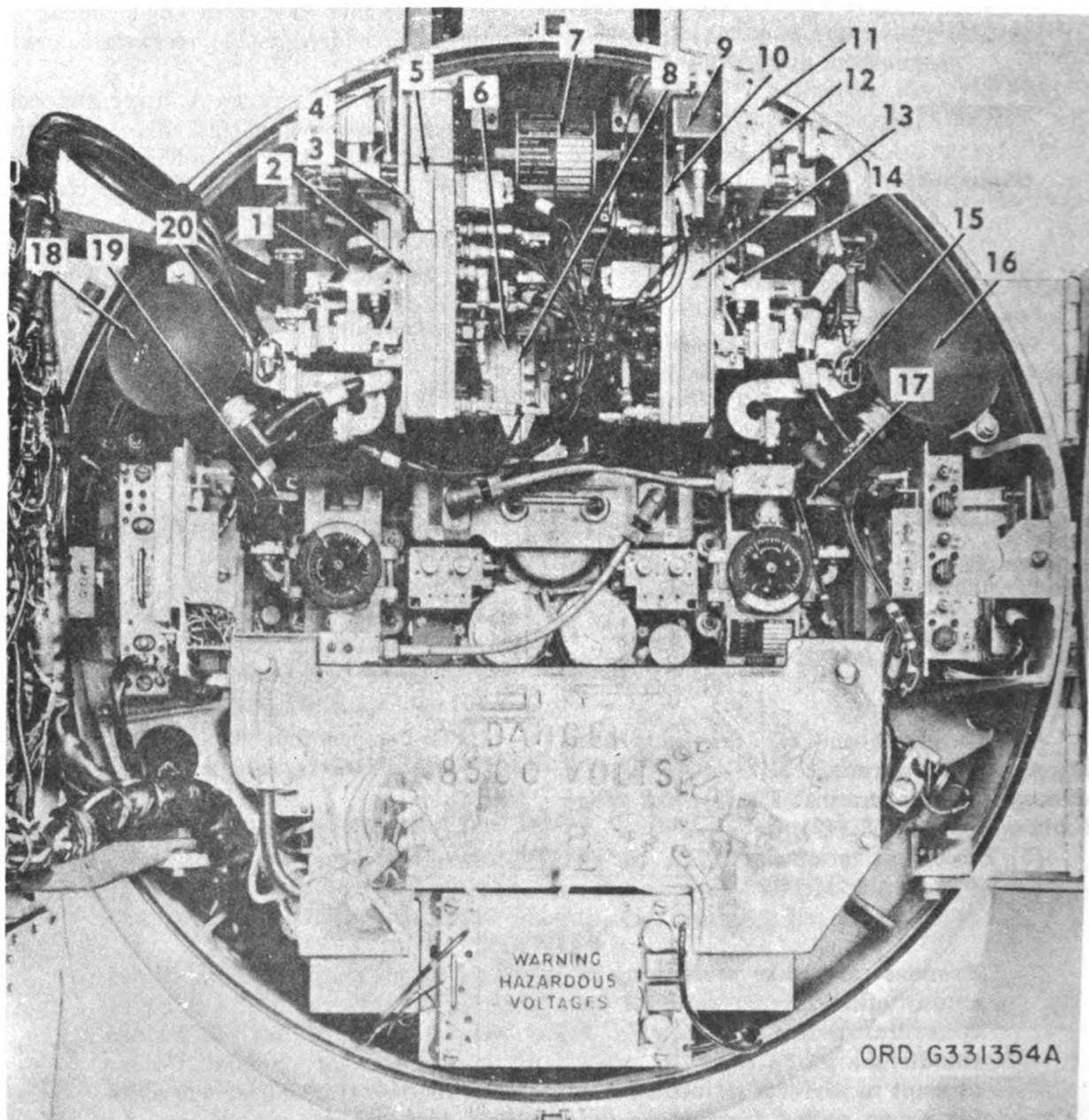
Exercise care when performing maintenance to prevent dust, iron filings, or any other foreign material from entering the waveguide. The range receiver-transmitter subassembly group weighs approximately 45 pounds. Handle the group carefully when removing to prevent damage. Do not attempt to perform maintenance with range receiver-transmitter subassembly group pulled forward on guide rails.

(16) Carefully pull range receiver-transmitter subassembly group (13) forward on guide rails (14), and remove the range receiver-transmitter subassembly group. Invert range receiver-transmitter subassembly group to rest on bracket (17) for performing maintenance.

(17) Remove four pan-head screws and lockwashers (3 and 4, fig. 48.13), and remove IF preamplifier (5).

(18) Remove twelve hexagon-socket-head screws and lockwashers (1 and 2) from waveguide flanges (12), (26) and (27).

(19) Remove four hexagon-nuts, lockwashers, and flathead screws (6, 7, and 8), and remove range A frequency mixer stage group (9).



- 1—Range A mixer
- 2—AFC preamplifier
- 3—Terminal E4
- 4—Terminal board TB4
- 5—Range IF preamplifier
- 6—Panoramic range IF preamplifier
- 7—Backward-wave oscillator
- 8—Terminal E2
- 9—RF switch
- 10—Range IF preamplifier

- 11—Tuning switch driver
- 12—Terminal E3
- 13—AFC preamplifier
- 14—Range B mixer
- 15—Waveguide coupling
- 16—Backward-wave oscillator
- 17—Waveguide coupling
- 18—Backward-wave oscillator
- 19—Waveguide coupling
- 20—Waveguide coupling

*Figure 48.11. Range receiver-transmitter—
interior view.*

b. Removal and Installation of Directional Coupler, Variable Attenuator, or Waveguide Assembly.

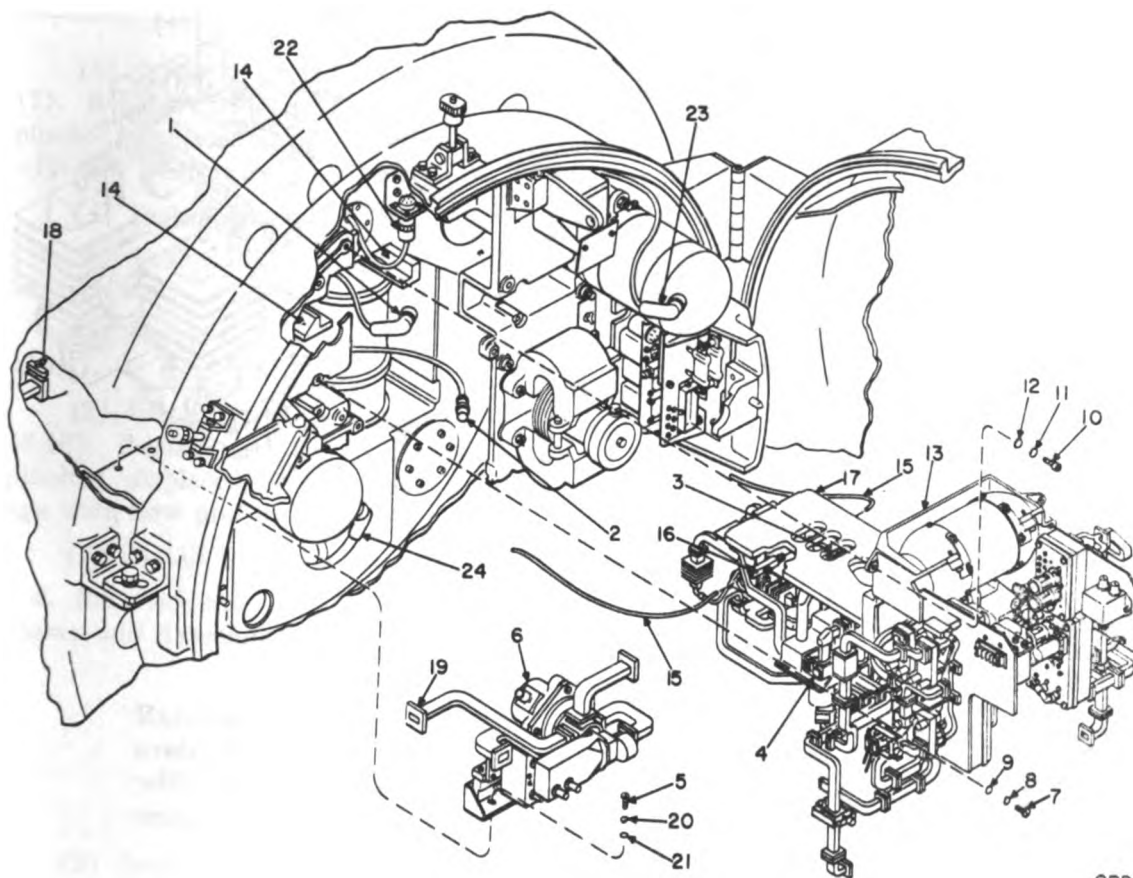
NOTE

Procedures for removal and installation of the variable attenuators (fig. 48.14, range A, or 48.14.1, range B) and waveguide assembled are identical to procedures for removal and installa-

tion of the directional coupler below except for the physical location and number of waveguide flanges to be disconnected and connected.

(1) Remove twelve hexagon-socket-head screws and lockwashers (1 and 2, fig. 48.15).

(2) Remove directional coupler (3) from the assembly.

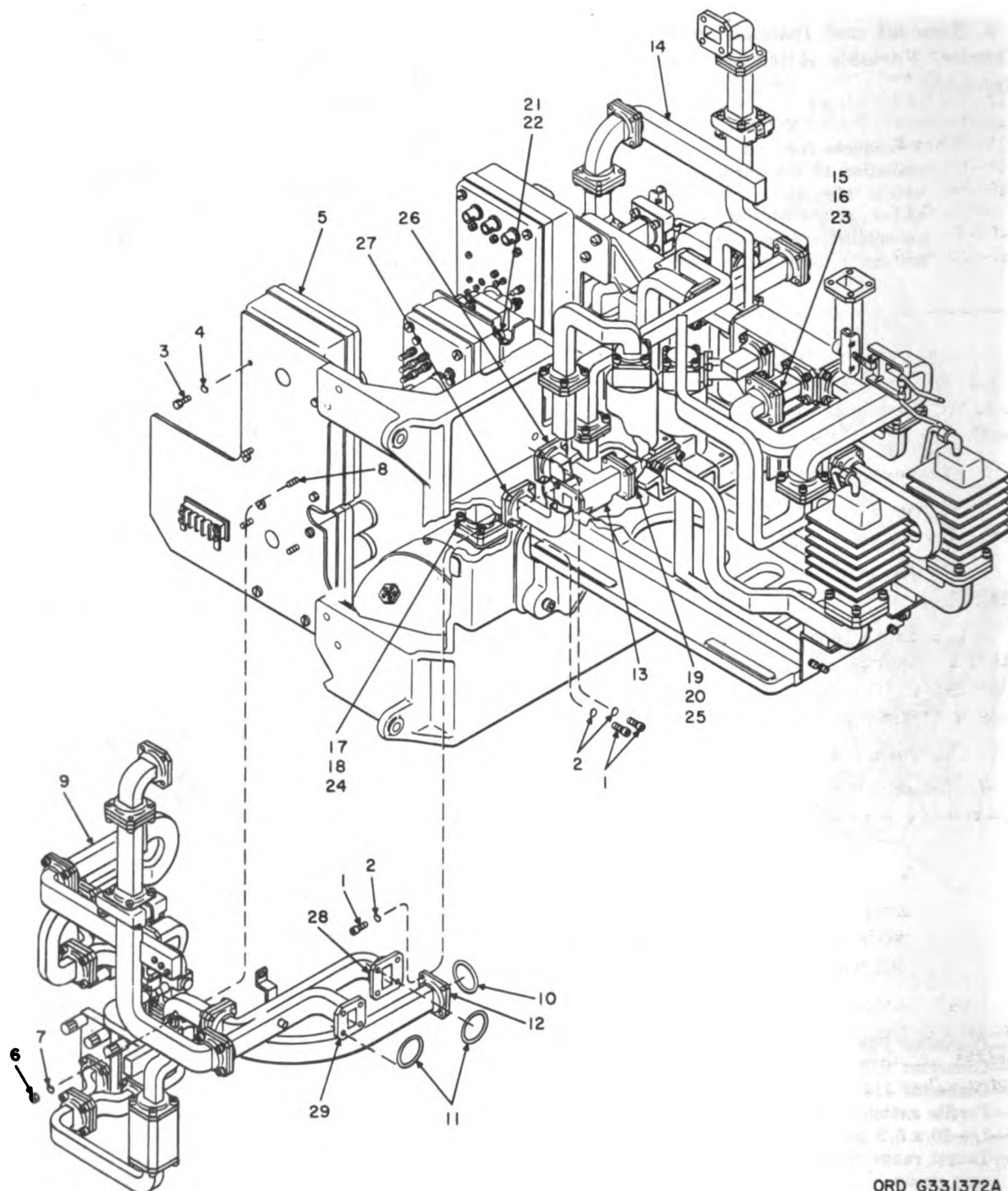


ORD G331371A

- 1—Connector P29
- 2—Connector P38
- 3—Connector J12
- 4—Ferrite switch mounting bracket
- 5—1/4-20 x 5/8 pan-hd screw (3)
- 6—Target range receiver-transmitter-waveguide assy group
- 7—No. 6-32 x 3/8 pan-hd screw (4)
- 8—No. 6 lockwasher (4)
- 9—0.156-in. flat washer (4)
- 10—1/4-20 x 7/8 hex-socket-hd screw (4)
- 11—1/4-in. lockwasher (4)
- 12—0.231-in. flat washer (4)

- 13—Range receiver-transmitter subassy group
- 14—Guide rails (2)
- 15—Hose couplings (2)
- 16—Manifold
- 17—Bracket
- 18—Waveguide coupling
- 19—Waveguide
- 20—1/4-in. lockwasher (3)
- 21—0.231-in. flat washer (3)
- 22—Connectors P24 and J9
- 23—Connector P27
- 24—Connector P9

Figure 48.12. Range receiver-transmitter—partially exploded view.



ORD G331372A

- 1—No. 6-32 x 3/8 hex-socket-hd screw (12)
- 2—No. 6 lockwasher (12)
- 3—No. 8-32 x 7/8 pan-hd screw (4)
- 4—No. 8 lockwasher (4)

- 5—IF amplifier (2)
- 6—No. 8-32 hexnut (4)
- 7—No. 8 lockwasher (4)
- 8—No. 8-32 x 1/2 flat-hd screw (4)

Figure 48.13. Range receiver-transmitter subassembly group—partially exploded view.

- 9—Range A frequency mixer stage group
- 10—Preformed packing
- 11—Preformed packing (2)
- 12—Waveguide flange
- 13—Panoramic frequency mixer stage
- 14—Range B frequency mixer stage group
- 15—No. 6-32 x 3/8 hex-socket-hd screw (4)
- 16—No. 6 lockwasher (4)
- 17—No. 6-32 x 3/8 hex-socket-hd screw (4)
- 18—No. 6 lockwasher (4)
- 19—No. 6-32 x 3/8 hex-socket-hd screw (4)
- 20—No. 6 lockwasher (4)
- 21—No. 8-32 hex nut (4)
- 22—No. 8 lockwasher (4)
- 23—Preformed packing
- 24—Preformed packing
- 25—Preformed packing
- 26—Waveguide flange
- 27—Waveguide flange
- 28—Waveguide flange
- 29—Waveguide flange

Figure 48.13—Continued.

(3) Inspect three preformed packings (7). Replace preformed packings which are pinched, displaced, or show evidence of damage with new preformed packings.

(4) Install directional coupler (3).

c. Removal and Installation of TRL Electron Tube.

(1) Remove TRL electron tube (3, fig. 48.16).

(2) Inspect preformed packing (6, fig. 48.16). Replace preformed packing which is pinched, displaced, or shows evidence of damage with new preformed packing.

(3) Install TRL electron tube.

d. Removal and Installation of Waveguide Clamp and Associated Parts.

NOTE

One type of waveguide clamp, installed to permit the clamp to slide along the waveguide when released, is shown in figure 48.17. Another type of waveguide clamp, rigidly secured to the waveguide flange when released, is shown in figure 48.18. Refer to figure 48.17 or 48.18, as applicable, and remove and install the waveguide clamp and associated parts.

e. Installation of Range A Frequency Mixer Stage Group.

(1) Inspect three preformed packings (10 and 11, fig. 48.13). Replace preformed packings which are pinched, displaced, or show evidence of damage with new preformed packings.

CAUTION

Exercise care when installing range A frequency mixer stage group to avoid damage to mixer assembly (7, fig. 48.14). Engage mixer assembly with associated jacks on range receiver-transmitter subassembly group carefully.

(2) Secure range A frequency mixer stage (9, fig. 48.13) to range receiver-transmitter subassembly group with four screws, lockwashers, and hexagon nuts (8, 7, and 6).

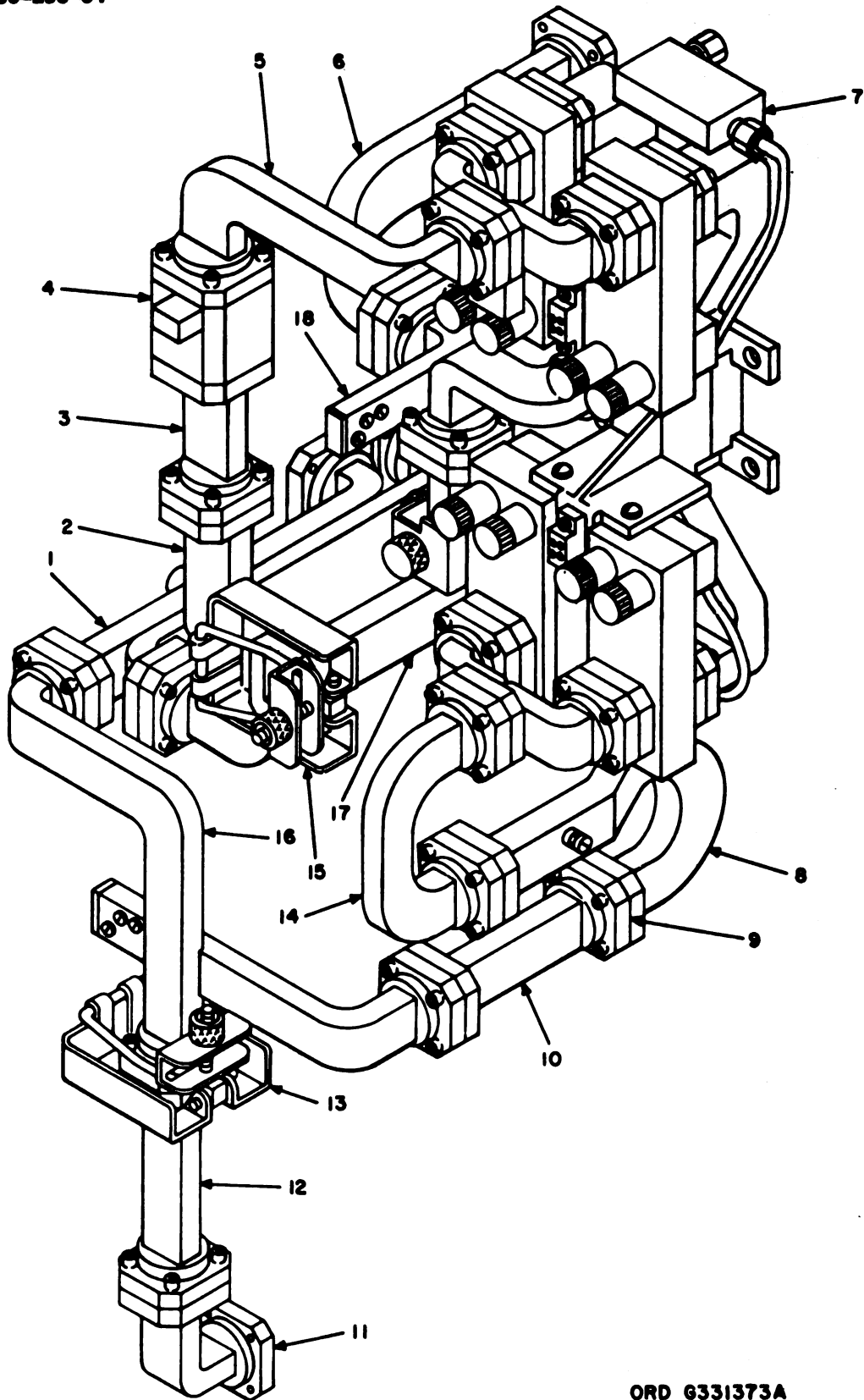
(3) Secure waveguide flange (12) to panoramic frequency mixer stage (13) with four lockwashers and hexagon-socket-head screws (2 and 1).

(4) Secure waveguide flanges (28) and (29) to waveguide flanges (26) and (27) with eight lockwashers and hexagon-socket-head screws (2 and 1).

(5) Secure I.F. amplifier (5), using four lockwashers and pan-head screws (4 and 3).

CAUTION

The range receiver-transmitter subassembly group weighs approximately 45 pounds. Handle the group carefully when installing to prevent damage. Avoid bumping or straining waveguides.



ORD 6331373A

Figure 48.14. Range A frequency mixer stage group.

1—Waveguide assy 10666252
 2—Waveguide assy 10667142
 3—Waveguide assy 9141828
 4—TRL electron tube
 5—Waveguide assy 10666263
 6—Waveguide assy 10658372
 7—Mixer assy
 8—Variable attenuator 10666271
 9—Waveguide seal

10—Waveguide assy 9016240
 11—Waveguide assy 10667178
 12—Waveguide assy 9150822
 13—Waveguide clamp
 14—Waveguide assy 10666270
 15—Waveguide clamp
 16—Directional coupler 9150811
 17—Variable attenuator 10667116
 18—Directional coupler 10667117

Figure 48.14. Range A frequency mixer stage group — legend.

- (6) Place range receiver-transmitter subassembly group (13, fig. 48.12) on guide rails (14), and slide the group into the range receiver-transmitter.
- (7) Install four flat washers, lockwashers, and hexagon-socket-head screws (12, 11, and 10).
- (8) Install four flat washers, lockwashers, and pan-head screws (9, 8, and 7).
- (9) Connect hoses (15) to airline manifold (16).
- (10) Connect connector P33 (2) to J12 (3).
- (11) Connect waveguide coupling (35, fig. 48.10).
- (12) Secure three pan-head screws (5, fig. 48.12).
- (13) Connect connectors P29 (1), P27 (23), and P9 (24) to backward-wave oscillators (7, 16, and 18, fig. 48.11), respectively.
- (14) Connect four waveguide couplings (15, 17, 19, and 20).
- (15) Connect range A mixer group and range B mixer group hose couplings (16, fig. 48.10) to airline manifold (19).
- (16) Replace connector J13 on the tuning switch driver; plug the tuning switch driver (11, fig. 48.11) into the connector; replace the cover on the tuning switch driver.
- (17) Connect terminals 11, 12, 13, and 14 to the spade side of TB2.
- (18) Connect leads to range A mixer terminal E4 (3), panoramic mixer (terminal E2 (8), and range B mixer terminal E3 (12).
- (19) Connect all mating connectors listed in *a* (3) above.
- (20) Install tuning drive (para 70.34).

70.46. Panoramic Frequency Mixer Stage

Warning: The range receiver-transmitter contains voltages DANGEROUS TO LIFE. Set the TRR POWER switch on the range radar power control-indicator to OFF.

Caution: The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from the magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of the magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

- (1) Remove the range receiver-transmitter subassembly group (para 70.45 *a*(1) through (16)).
- (2) Remove 16 hexagon-socket-head screws (1, 15, 17, and 19, fig. 48.13) and lockwashers (2, 16, 18, and 20).
- (3) Remove four hexagon nuts (21) and lockwashers (22).
- (4) Remove panoramic frequency mixer stage (13).

b. Disassembly and Assembly.

Note. Removal of parts from all the frequency mixer stages is similar.

- (1) Disassemble the panoramic frequency mixer stage (fig. 48.19). Refer to paragraph 70.45 *c* or *d* as applicable.
- (2) Assemble the panoramic frequency mixer stage (fig. 48.19). Refer to paragraph 70.45 *c* or *d* as applicable.

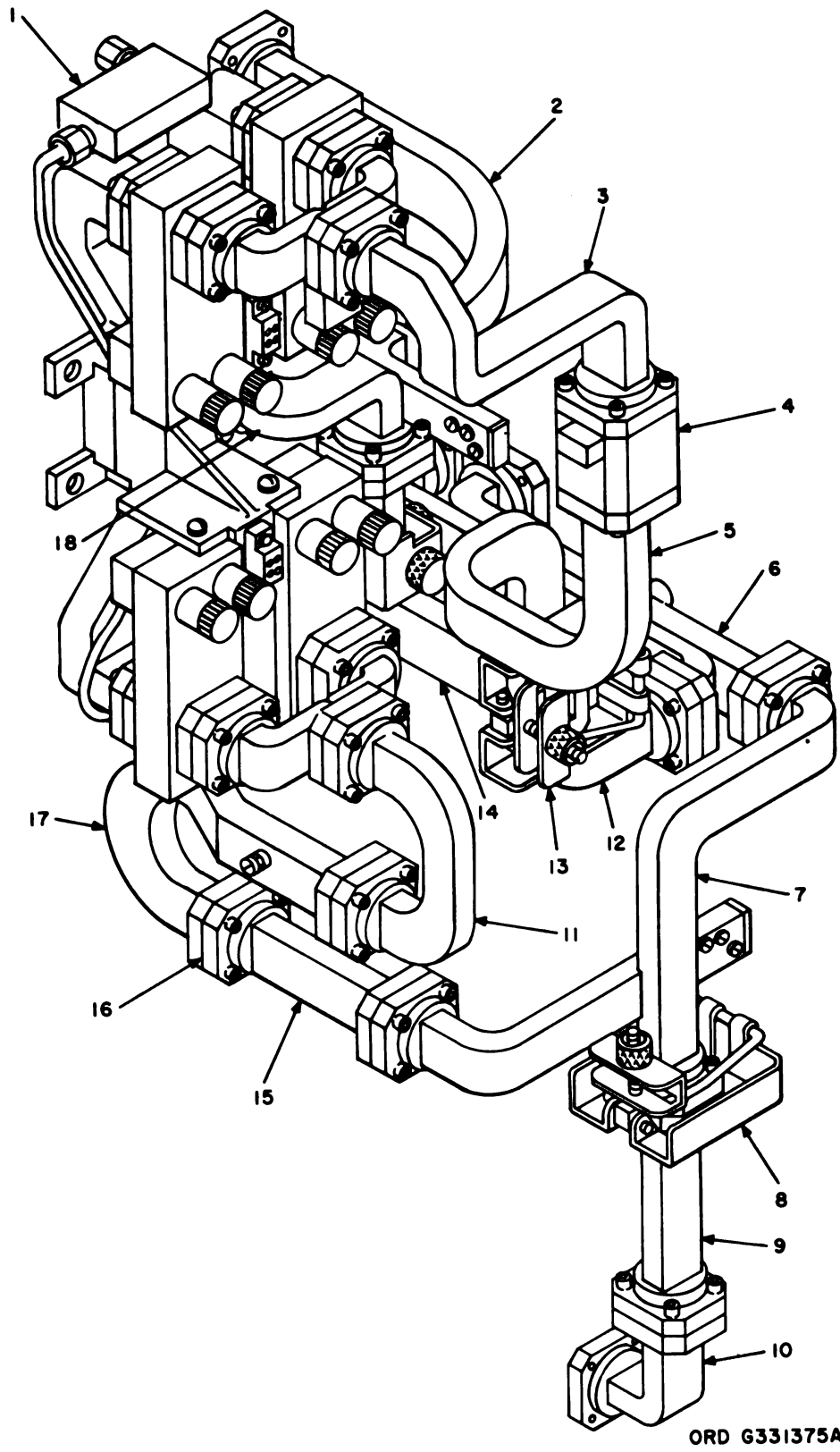


Figure 48.14.1. Range B frequency mixer stage group.

1—Mixer assembly	10—Waveguide assy 10667178
2—Waveguide assy 10668378	11—Waveguide assy 10666270
3—Waveguide assy 10666200	12—Waveguide assy 10667468
4—TRL electron tube	13—Waveguide clamp
5—Waveguide assy 10667144	14—Variable attenuator 10667118
6—Waveguide assy 10666252	15—Waveguide assy 9016240
7—Directional coupler 9150848	16—Waveguide seal
8—Waveguide clamp	17—Variable attenuator 10666272
9—Waveguide assy 9150822	18—Directional coupler 10667115

*Figure 48.14.1—Continued.***c. Installation.**

(1) Inspect preformed packings (10, 23, 24, and 25, fig. 48.18). Replace preformed

packings which are pinched, displaced, or show evidence of damage with new preformed packings.

CAUTION

Exercise care when installing panoramic frequency mixer stage to avoid damage to crystals in crystal group (8, fig. 48.19). Engage crystal group with associated jacks on range receiver-transmitter subassembly group carefully.

(2) Install the panoramic frequency mixer stage in the reverse order of removal, *a* above.

70.47. Ferrite Switches and Associated Parts**WARNING**

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal

(1) Remove range receiver-transmitter subassembly group (para 70.45 *a*(1) through (16)).

(2) Remove twenty hexagon-socket-head screws and lockwashers (1 and 2, fig. 48.20) to disconnect waveguide flanges from panoramic frequency mixer stage (3), range A frequency mixer stage (4), and range B frequency mixer stage (5).

(3) Remove four pan-head screws, lockwashers, and flat washers (6, 7, and 8) from waveguide support (9).

(4) Remove four pan-head screws, lockwashers and flat washers (10, 11, and 12), and remove the ferrite switches (13) and associated parts.

b. Installation.

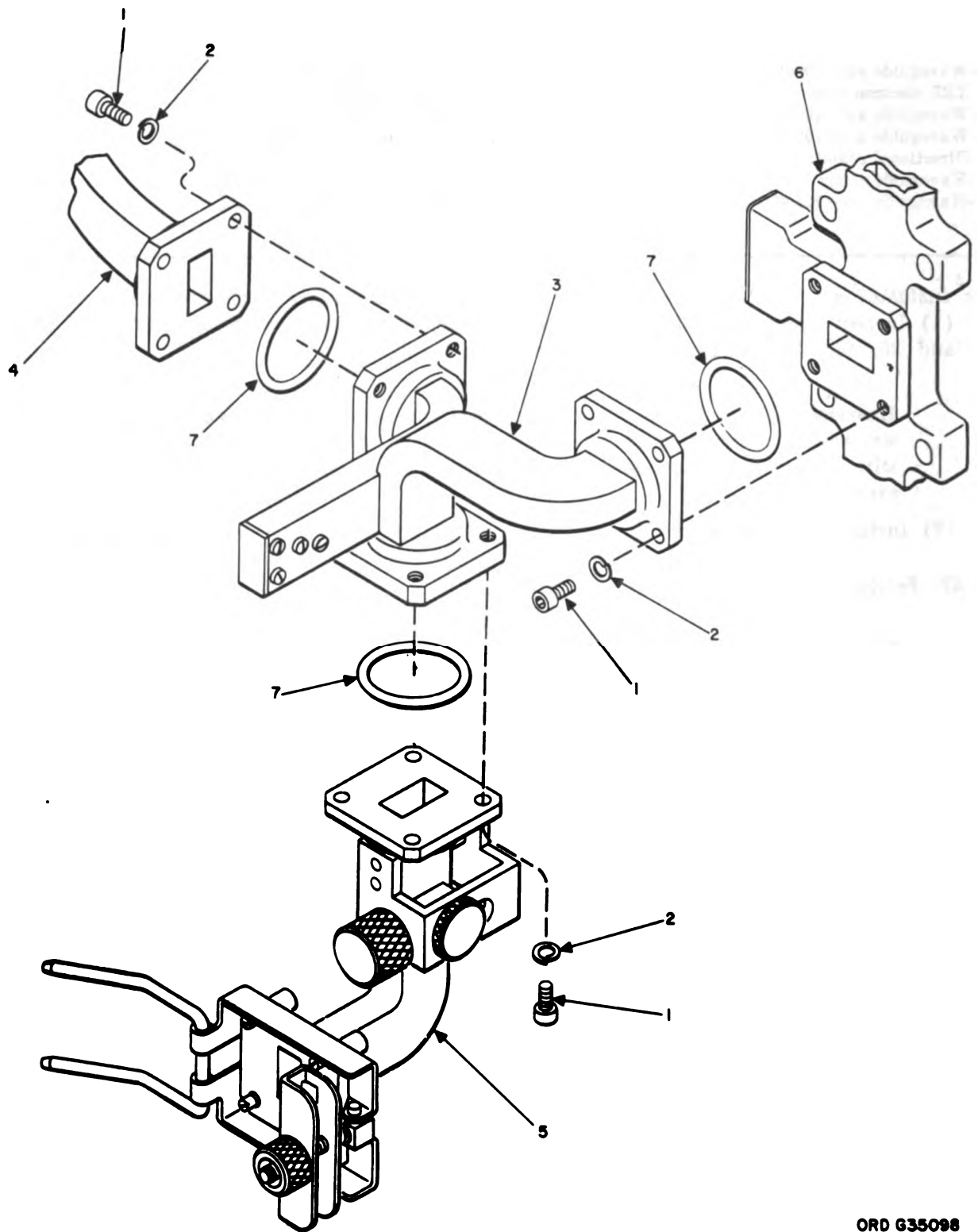
(1) Inspect preformed packings (14, fig. 48.20); replace as necessary.

(2) Install the ferrite switches in the reverse order of removal, *a* above.

(3) Perform the TRR transmitter checks in accordance with the track check procedures manual (para 3).

70.48. Target Range Receiver-Transmitter Waveguide Assembly Group**WARNING**

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Set TRR POWER switch on range radar power control-indicator to OFF.



ORD G35098

- 1—No. 6-32 x 3/8 hex-socket hd screw (12)
- 2—No. 6 lockwasher (12)
- 8—Directional coupler
- 4—Waveguide

- 5—Waveguide group
- 6—Mixer stage group
- 7—Performed packing (8)

Figure 48.15. Removal and installation of directional coupler.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

- 4—Waveguide group
- 5—Waveguide group
- 6—Preformed packing

Figure 48.16—Continued.

a. Removal.

(1) Remove the range receiver-transmitter subassembly group (para 70.45 a(1) through (16)).

(2) Disconnect waveguide coupling (18, fig. 48.12) from waveguide (19).

(3) Disconnect connectors P6 and P8 from J1 (7, fig. 48.21) and J2 (6) on RF bolometer (8).

(4) Disconnect connectors P4 and P5 from J1 (4) and J2 (5) on noise generator (3).

(5) Disconnect connector P32 from J1 (1) on waveguide switch (2).

(6) Remove three pan-head screws, lockwashers, and flat washers (5, 20, and 21, fig. 48.12); remove target range receiver-transmitter waveguide assembly group (6) from range receiver-transmitter.

b. Disassembly.

Disassemble the target range receiver-transmitter waveguide assembly group (fig. 48.22).

c. Assembly.

(1) Inspect all preformed packings (38, fig. 48.22); replace as necessary.

(2) Apply antiseize compound 8080-251-3988 to the threads of hexagon-socket-head screws (5, 8, 12, 15, and 23).

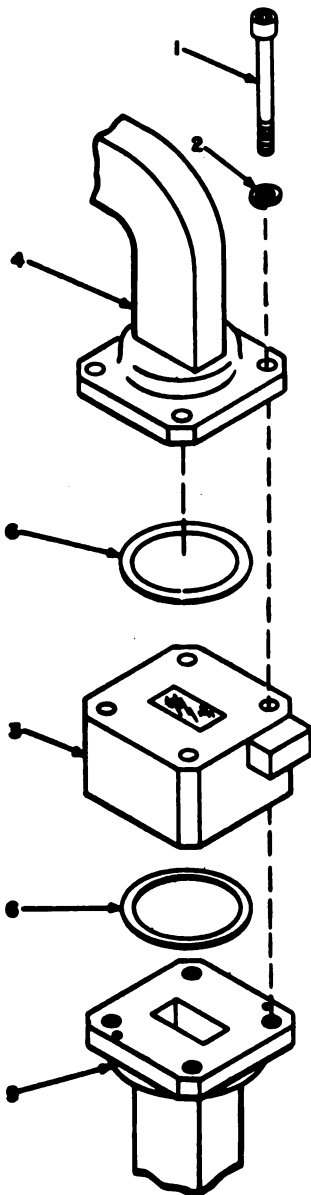
(3) Assemble the target range receiver-transmitter waveguide assembly group.

d. Installation.

NOTE

Do not tighten pan-head screws (5, fig. 48.12) until the waveguide has been aligned.

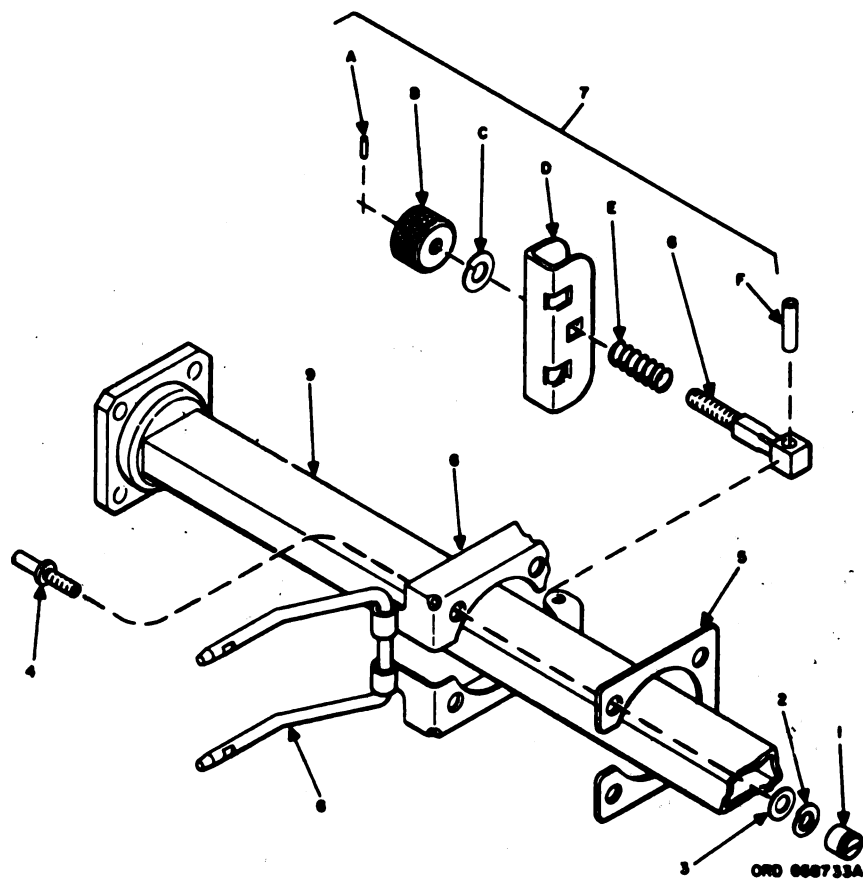
Install the target range receiver-transmitter waveguide assembly group in the reverse order of removal, a above.



ORD 6331374A

- 1—No. 6-32 x 1-1/4 hex-socket-hd screw (4)
- 2—No. 6 lockwasher (4)
- 3—TRL electron tube

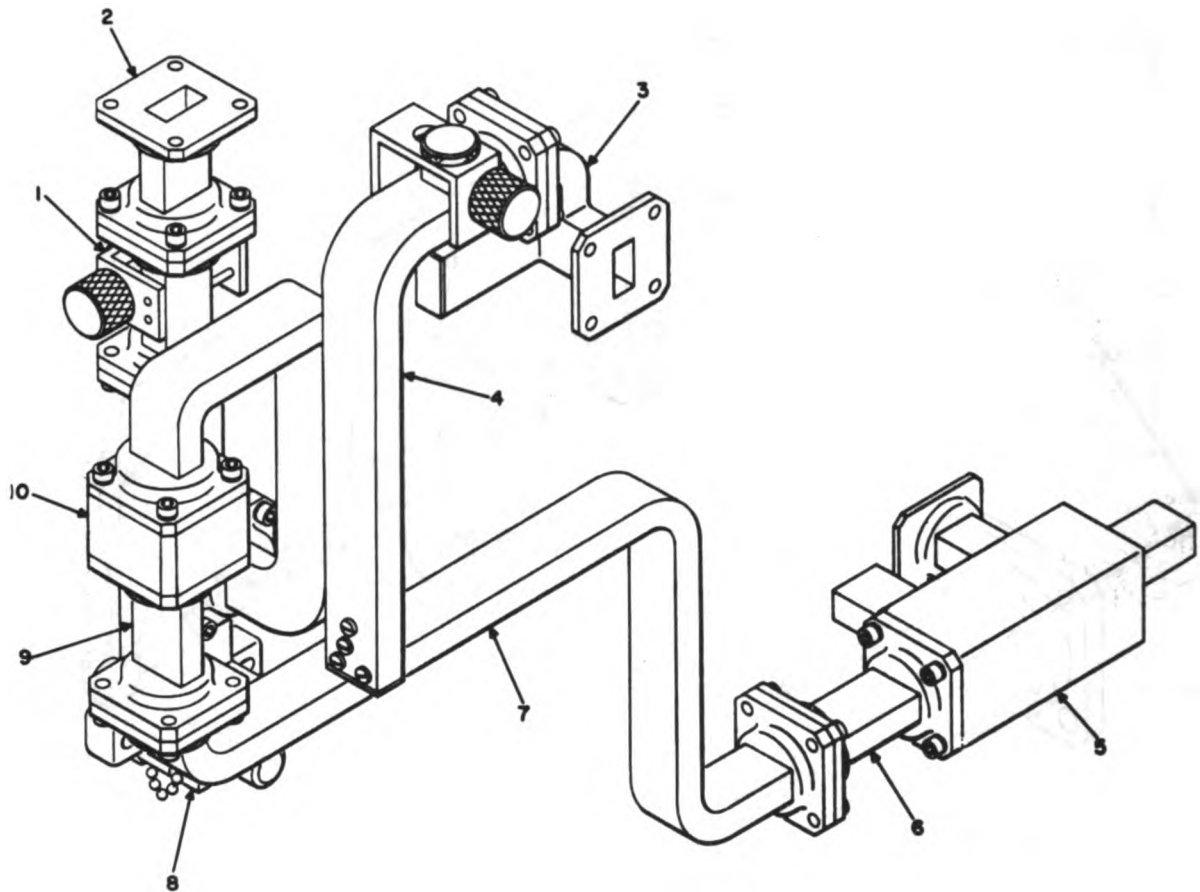
Figure 48.16. Removal and installation of TRL electron tube.



- 1—Round nut (4)
- 2—No. 6 lockwasher (4)
- 3—0.156-in. flat washer (4)
- 4—Shoulder screw (4)
- 5—Retainer plate
- 6—Spring
- 7—Clamp assy
- A—Headless straight pin 9160837

- B—Knurled nut
- C—No. 8 lockwasher
- D—Bracket
- E—Spring
- F—Headless straight pin
- G—Exter-relieved-body screw
- 8—Waveguide adapter
- 9—Waveguide

Figure 48.17. Removal and installation of waveguide clamp.

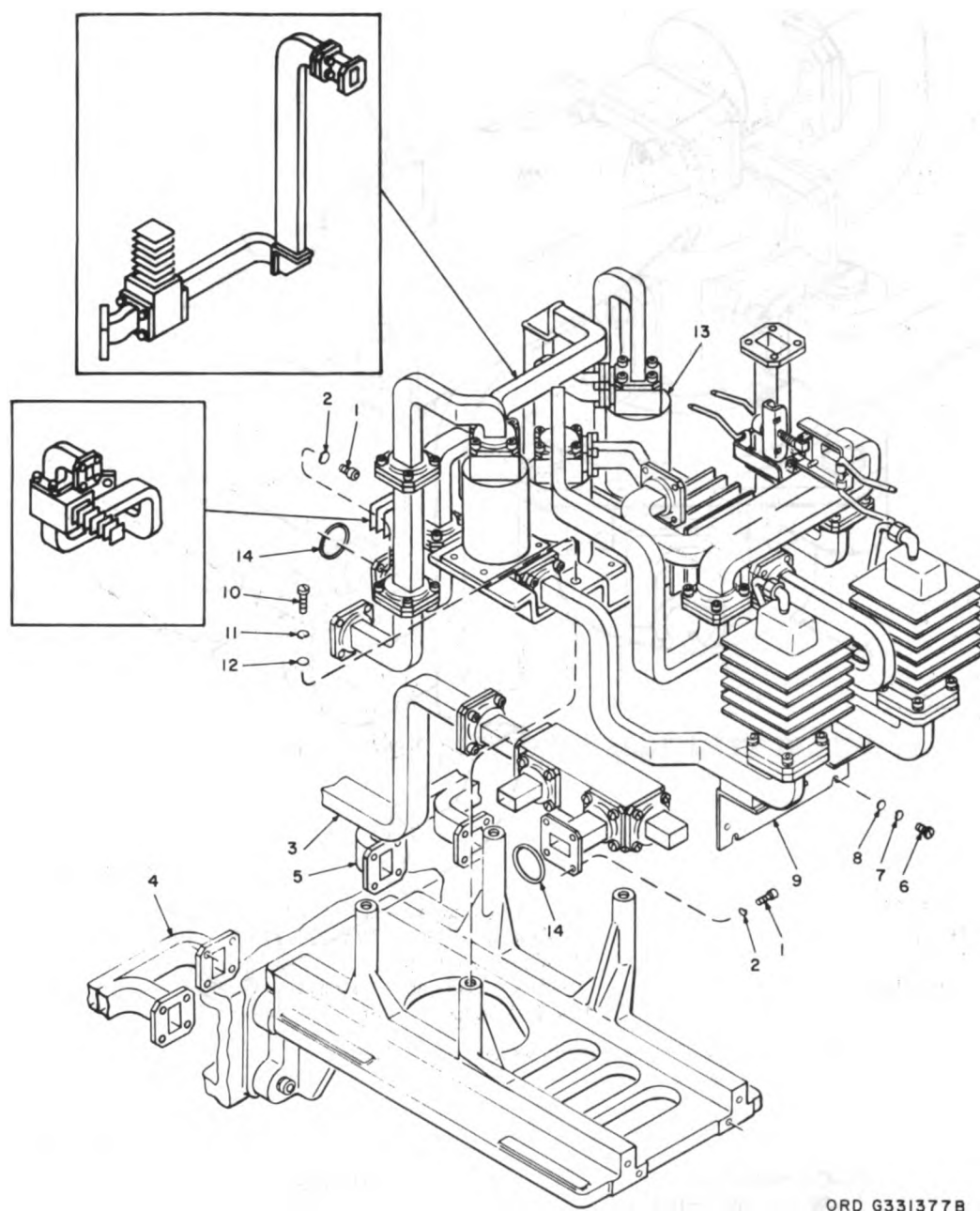


ORD 6331378A

- 1—Variable attenuator 9012234
- 2—Waveguide assy 9012233
- 3—Waveguide assy 9012237
- 4—Variable attenuator 9012235
- 5—Isolator

- 6—Waveguide assy 10067140
- 7—Waveguide assy 9156062
- 8—Crystal group
- 9—Waveguide assy 9016240
- 10—TRL electron tube

Figure 48.19. Panoramic frequency mixer stage.

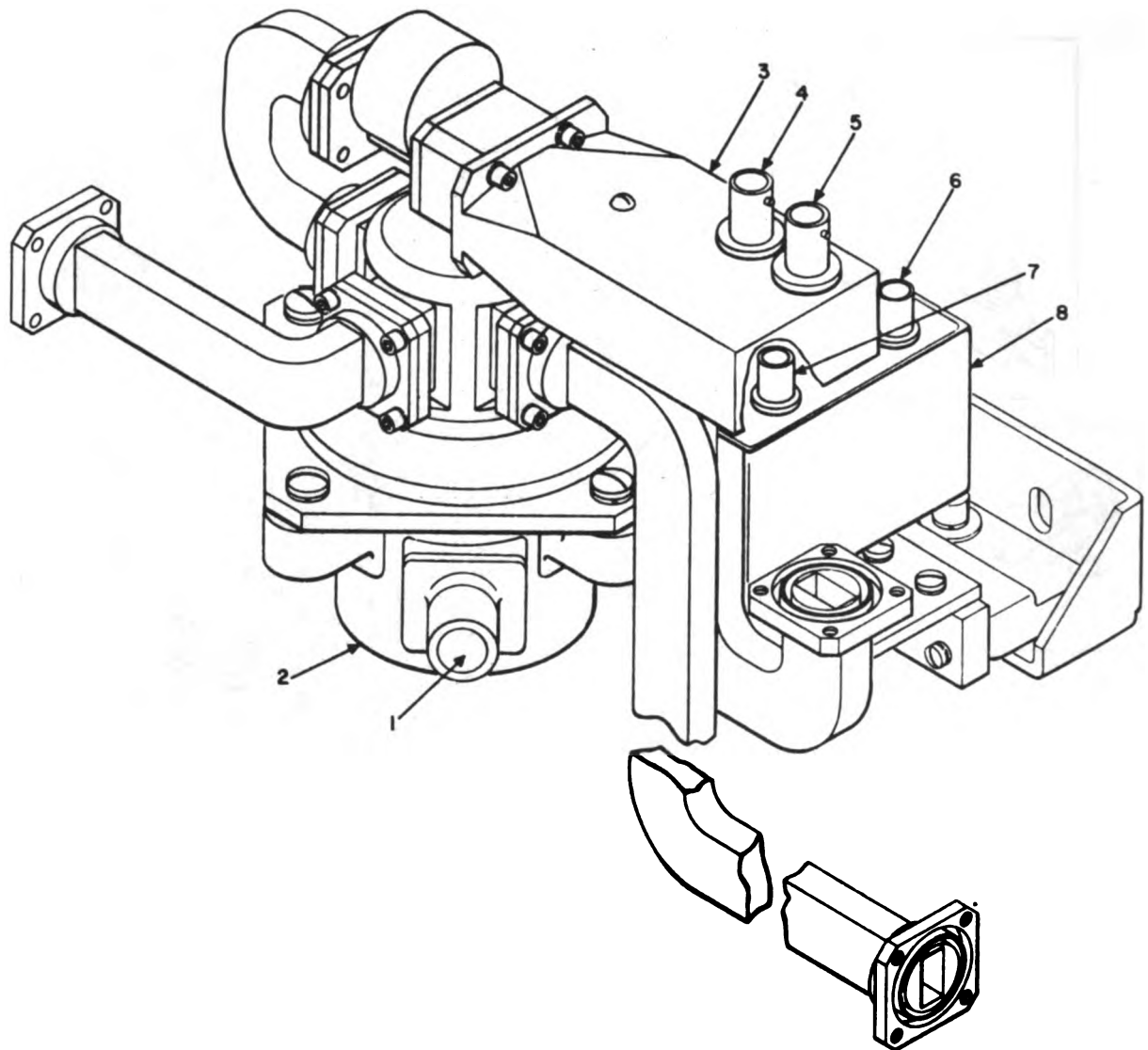


ORD G331377 B

- 1—No. 6-32 x 3/8 cap-socket-hd screw (20)
- 2—No. 6 lockwasher (20)
- 3—Panoramic frequency mixer stage
- 4—Range A frequency mixer stage waveguide flanges
- 5—Range B frequency mixer stage waveguide flanges
- 6—No. 6-32 x 3/8 pan-hd screw (2)

- 7—No. 6 lockwasher (2)
- 8—0.156-in fl washer (2)
- 9—Waveguide support
- 10—No. 10-24 x 7/8 pan-hd screw (4)
- 11—No. 10 lockwasher (4)
- 12—0.219-in fl washer (4)
- 13—Ferrite switches and associated parts
- 14—Preformed packing (5)

Figure 48.20. Removal and installation of waveguide switch and associated parts.



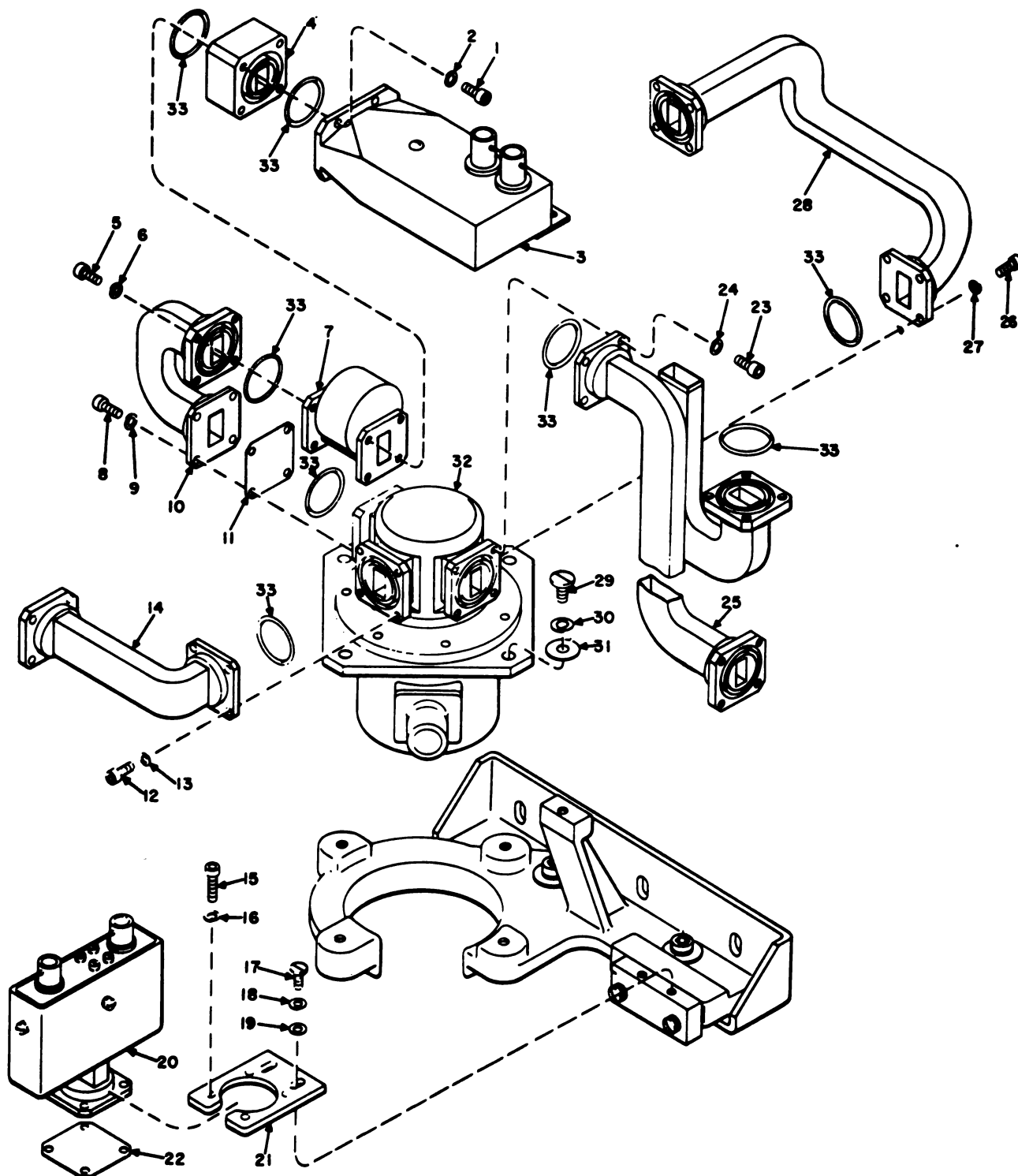
- 1—Connector J1
- 2—Waveguide switch
- 3—Noise generator
- 4—Connector J1

- 5—Connector J2
- 6—Connector J2
- 7—Connector J1
- 8—RF bolometer

ORD G331380A

Figure 48.21. Target range receiver-transmitter waveguide assembly group.

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ORD 6331381A

Figure 48.22. Target range receiver-transmitter waveguide assembly group—partially exploded view.

- | | |
|---|---|
| 1—No. 6-32 x 1 hex-socket-hd screws (4) | 18—No. 6 lockwasher (2) |
| 2—No. 6 lockwasher (4) | 19—0.375-in. flat washer (2) |
| 3—Noise generator | 20—RF bolometer |
| 4—Waveguide adapter | 21—Adjusting plate |
| 5—No. 6-32 x 3/8 hex-socket-hd screw (4) | 22—Waveguide seal |
| 6—No. 6 lockwasher (4) | 23—No. 6-32 x 3/8 hex-socket-hd screw (4) |
| 7—Isolator | 24—No. 6 lockwasher (4) |
| 8—No. 6-32 x 3/8 hex-socket-hd screw (4) | 25—Directional coupler group |
| 9—No. 6 lockwasher (4) | 26—No. 6-32 x 3/8 hex-socket-hd screw (4) |
| 10—Waveguide assembly 10666273 | 27—No. 6 lockwasher (4) |
| 11—Waveguide seal | 28—Waveguide assembly 10666267 |
| 12—No. 6-32 x 3/8 hex-socket-hd screw (4) | 29—No. 10-24 x 1/2 pan-hd screw (4) |
| 13—No. 6 lockwasher (4) | 30—No. 10 lockwasher (4) |
| 14—Waveguide assembly 9161046 | 31—0.438 in. flat washer (4) |
| 15—No. 6-32 x 1/2 hex-socket-hd screw (4) | 32—Waveguide switch |
| 16—No. 6 lockwasher (4) | 33—Preformed packing (8) |
| 17—No. 6-32 x 3/8 pan-hd screw (2) | |

Figure 48.32—Continued.

Section V. Miscellaneous Components

70.49. Airline Manifold and Associated Parts

WARNING

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Set TRR POWER switch on range radar power control-indicator to OFF.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Remove the tuning drive (para 70.34a), but do not remove offset coupling (18, fig. 48.4) from the tuning drive.

(2) Remove modulator subassembly (para 70.36a).

(3) Disconnect compressor hose coupling (15, fig. 48.10) and waveguide switch hose coupling (16).

(4) Loosen coupling nuts (17), and disconnect tubes (18 and 20) from airline manifold (19).

(5) Remove the airline manifold from the range receiver-transmitter.

b. Disassembly and Assembly.

Disassemble and assemble the airline manifold (fig. 48.10).

c. Installation.

CAUTION

Assure that gasket-forming compound is not left on the threads of the union.

(1) Apply gasket-forming compound 7612874 to the threads of new preformed packing (34, fig. 48.10), and screw preformed packing onto union (33).

NOTE

Apply antiseize compound 9080-251-3983 to the threads of the union and couplings (27) during installation.

(2) Omitting installation of the tuning drive, install the airline manifold and associated parts in the range receiver-transmitter.

(3) Perform the waveguide pressurizer check in accordance with the track check pro-

cedures manual (para 3). If the unit fails to pass the check, deenergize the system, and apply a soap-and-water solution to joints in the pressurizing system to check for leaks.

(4) Install tuning drive (para 70.84 b).

70.50. Vaneaxial Fan B11 or B12

WARNING

The range receiver-transmitter contains voltages DANGEROUS TO LIFE. Gain access as specified in the procedures.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

(1) Gain access to the main RF enclosure (para 11.11.3).

NOTE

Step (2) below is not required for fan B11.

(2) Remove the range pulse generator (para 70.85a).

(3) Disconnect connector P25 (15, fig. 48.8) from J6 for fan B12, or P24 (22, fig. 48.12) for fan B11.

(4) Disassemble the housing, and remove the fan (fig. 48.23).

b. Installation.

(1) Install the vaneaxial fan in the reverse order of removal, a above.

(2) Perform the TRR power checks in accordance with the check procedures manual (para 3).

70.51. Vaneaxial Fan B1, B2, B3 or B4

WARNING

The range receiver-transmitter contains voltages DANGEROUS TO LIFE. Gain access as specified in the procedures.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

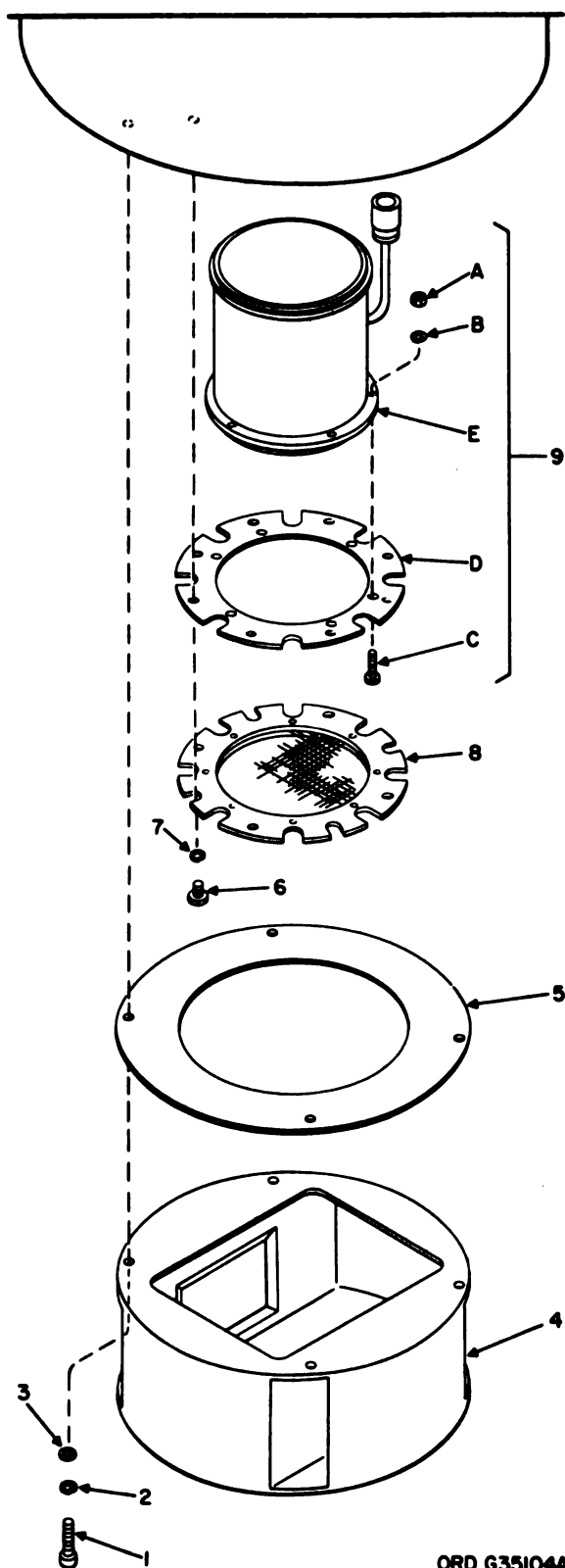
(1) Gain access to the main RF enclosure (para 11.11.3).

(2) Disconnect and tag the leads; remove the mounting hardware; and remove the fan (fig. 48.24).

b. Installation.

(1) Install the vaneaxial fan in the reverse order of removal, a above.

(2) Perform the TRR radar power checks in accordance with the track check procedures manual (para 3).

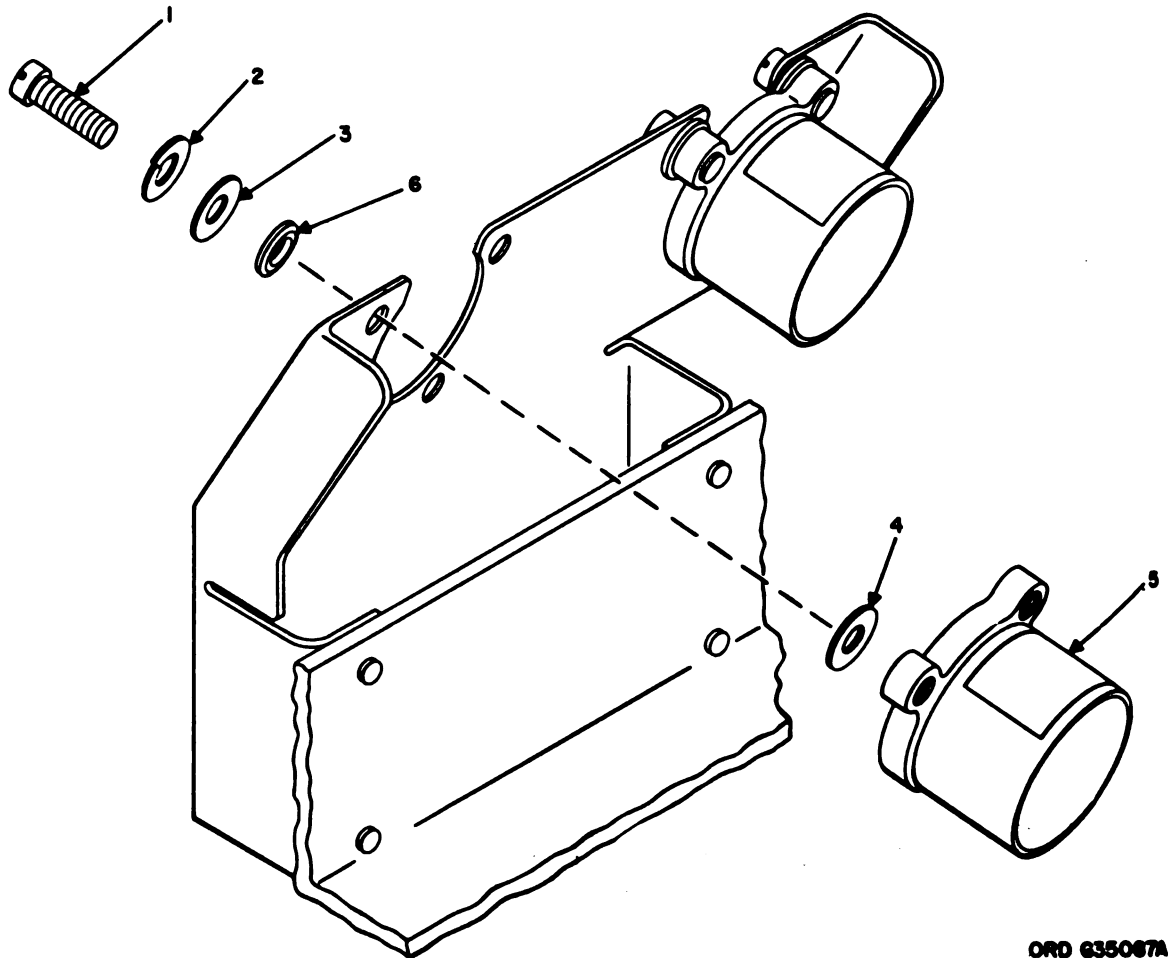


ORD G35104A

Figure 48.23. Removal and installation of vaneaxial fan.

- 1—5/16-18 x 7/8 hex-socket-hd screw (4)
- 2—5/16-in. lockwasher (4)
- 3—11/32-in. flat washer (4)
- 4—Housing
- 5—Gasket
- 6—No. 10-24 x 1/2 pan-hd screw (B11), or
No. 10-24 x 3/8 pan-hd screw (B12) (8)
- 7—No. 10 lockwasher (8)
- 8—Screened cover
- 9—Vaneaxial fan assy
 - A—No. 8-32 hex nut (6)
 - B—No. 8 lockwasher (6)
 - C—No. 8-32 x 1 1/8 fil-hd screw (6)
 - D—Adapter
 - E—Vaneaxial fan

Figure 48.23—Continued.



ORD 635087A

- 1—No. 8-32 x 7/8 pan-hd screw (3)
- 2—No. 8 lockwasher (3)
- 3—0.187-in. flat washer (3)

- 4—0.187-in. flat washer (3)
- 5—Vaneaxial fan
- 6—Rubber grommet

Figure 48.24. Removal and installation of vaneaxial fan—typical.

70.52. Handle and Associated Parts

WARNING

The range receiver-transmitter contains voltages **DANGEROUS TO LIFE**. Gain access as specified in the procedures.

CAUTION

The magnetron electron tubes contain strong magnets. Keep meters, watches, tools, and similar metallic objects at least 3 feet from magnetron tubes to prevent damage. Use nonmagnetic tools in the vicinity of magnetrons, backward-wave oscillators, and ferrite circulators.

a. Removal.

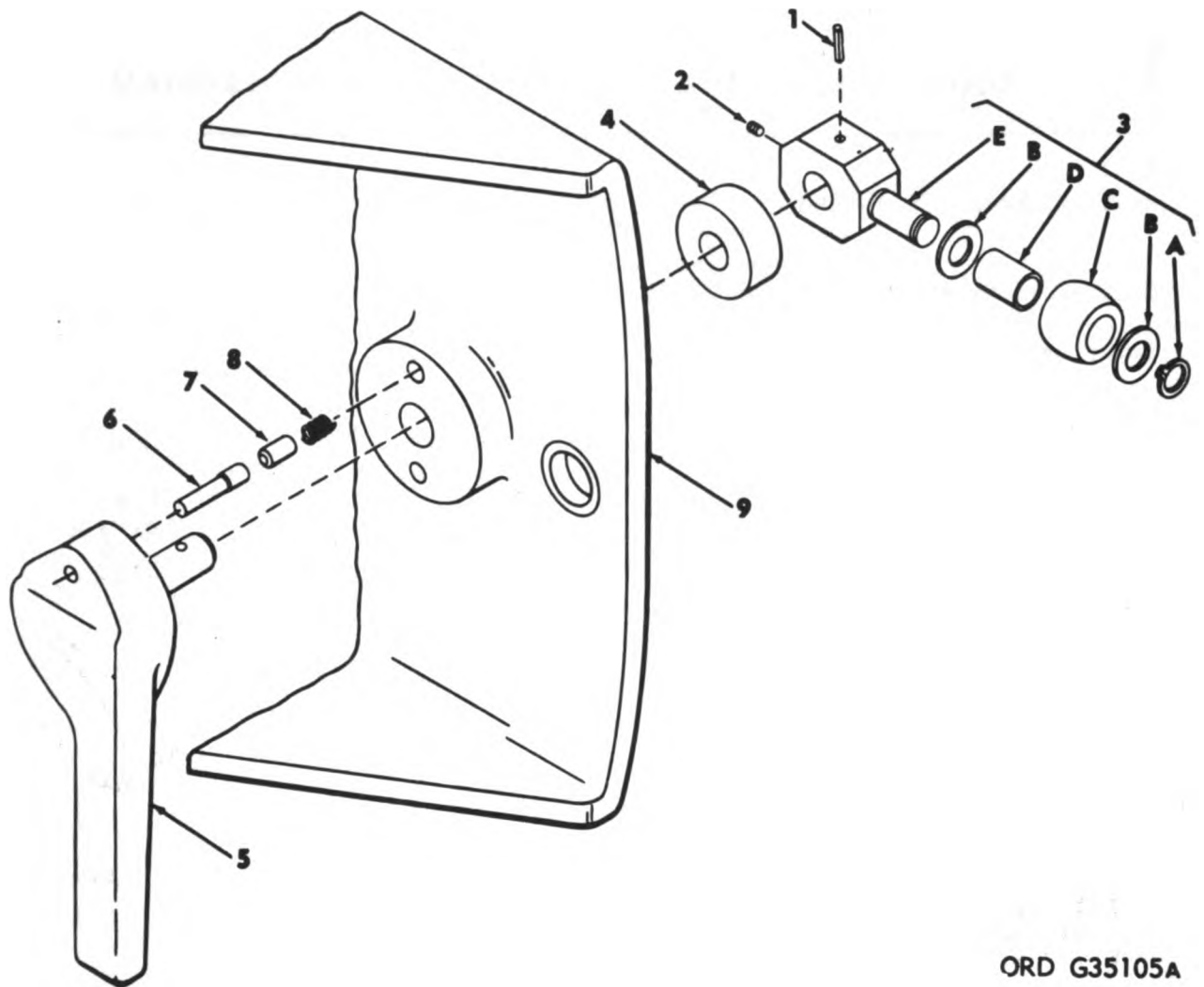
(1) Gain access to the rear of the main RF enclosure (para 11.11.3).

(2) Remove the handle and associated parts (fig. 48.25).

b. Installation.

Install the door handle and associated parts in the reverse order of removal, a above.

62.50



ORD G35105A

- 1-0.188 x 0.938 spring pin
 2-No. 10-24 x 1/4 setscrew
 3-Arm assy
 A-3/8-in. extender ring
 B-0.378-in. flat washer (2)
 C-Roller
 D-Sleeve bearing

- E-Arm
 4-Sleeve spacer
 5-Handle
 6-Headed pin
 7-Headless pin (2)
 8-Spring (2)
 9-Housing

Figure 48.25. Removal and installation of handle and associated parts.

Sections VI through XXII.

(Deleted)

CHAPTER 4

MAINTENANCE OF EQUIPMENT ENCLOSURE GROUP

Note. The equipment enclosure group (fig. 49) includes the jack leg assemblies and the equipment enclosures.

71, 72. (Deleted)

73. Electrical Test Panel Assembly

Warning: The roadside equipment enclosure contains voltage **DANGEROUS TO LIFE**. Turn **TARGET POWER** switch or **MISSILE POWER** switch, as applicable, on the radar-power-control panel to off position,

and discharge capacitors C23 and C24 before starting repairs.

a. Disassembly.

(1) Obtain access to the rear of the electrical test panel assembly (C, fig. 50).

(2) Disassemble the electrical test panel (fig. 52).

b. Assembly.

(1) Assemble the electrical test panel assembly (fig. 52).

(2) Perform the radar-system transmitter checks in accordance with the track check procedures manual (para 3).

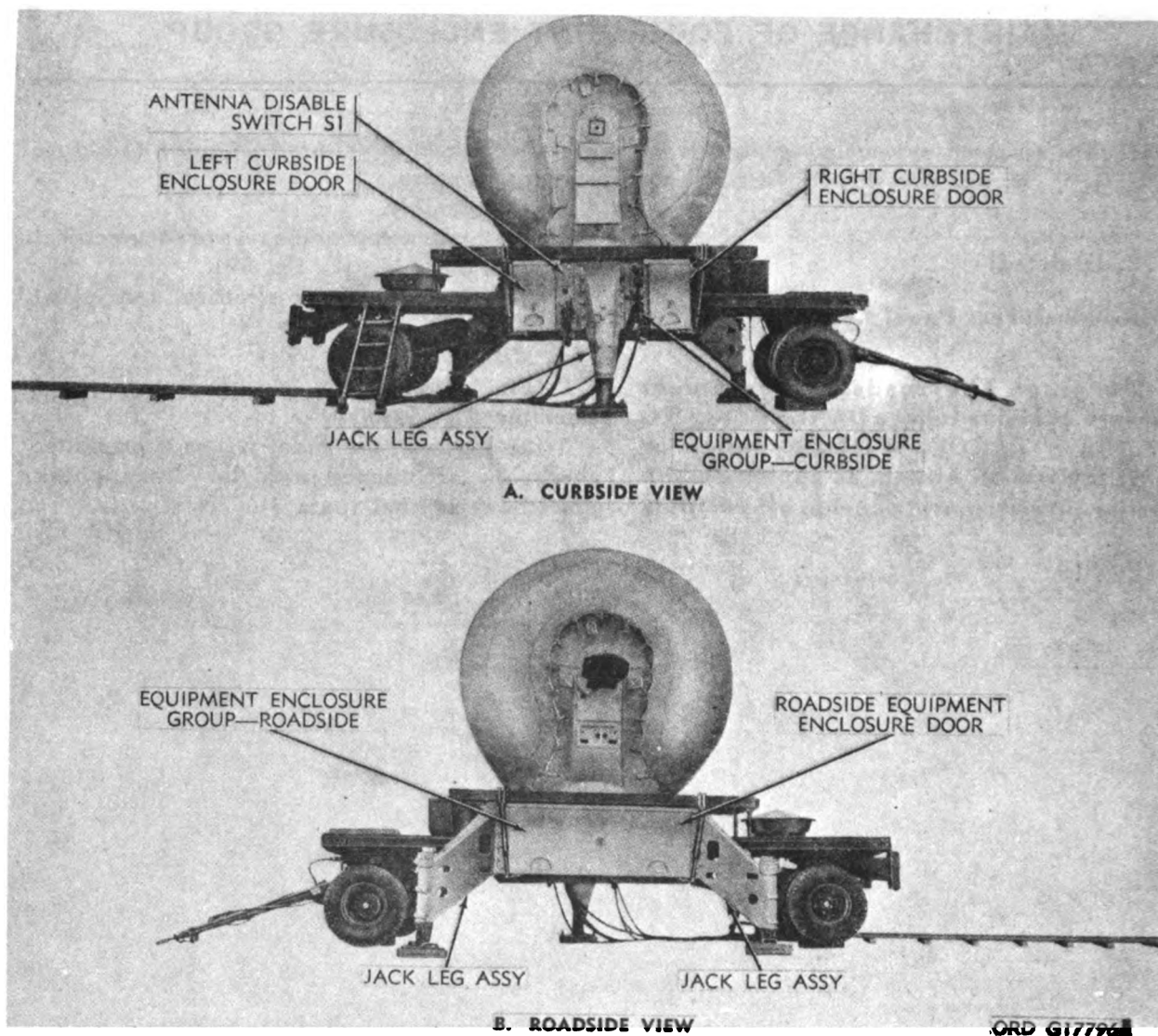
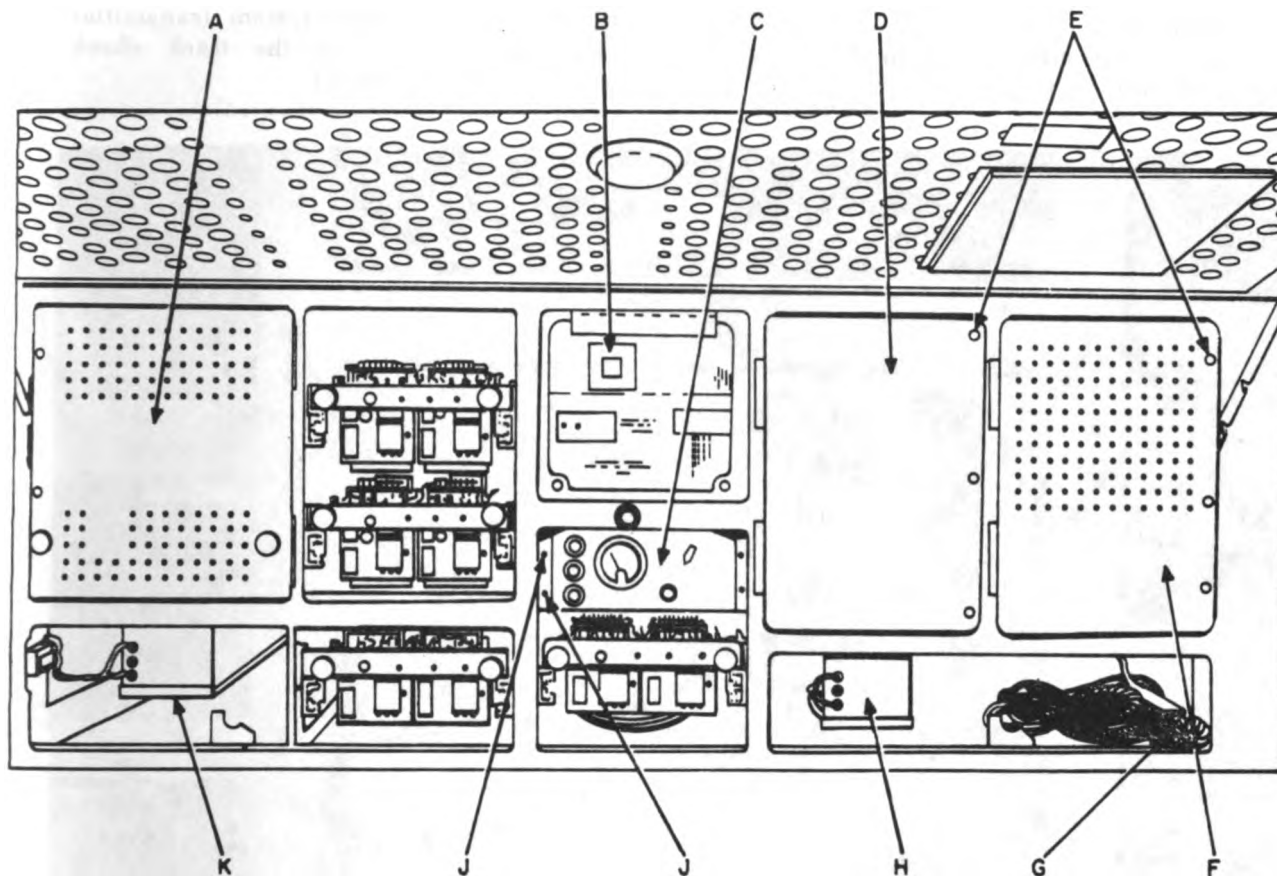


Figure 49. TTR or MTR—locational views.



ORD G331396A

- A—Rectifier power supply subassy compartment door
- B—Azimuth position transmitter window door
- C—Electrical test panel assy
- D—Transformer and filter power supply subassy compartment door
- E—Fasteners (6)
- F—Track trigger amplifier compartment door
- G—Rope
- H—Electrical filter Z3
- J—Fasteners
- K—Electrical filter Z2

Figure 50. Roadside equipment enclosure—door opened.

74. Meter Panel

Warning: The roadside equipment enclosure contains voltages **DANGEROUS TO LIFE**. Turn TRR POWER switch on range radar power control-indicator to off position and discharge capacitors C17 and C18 before starting repairs.

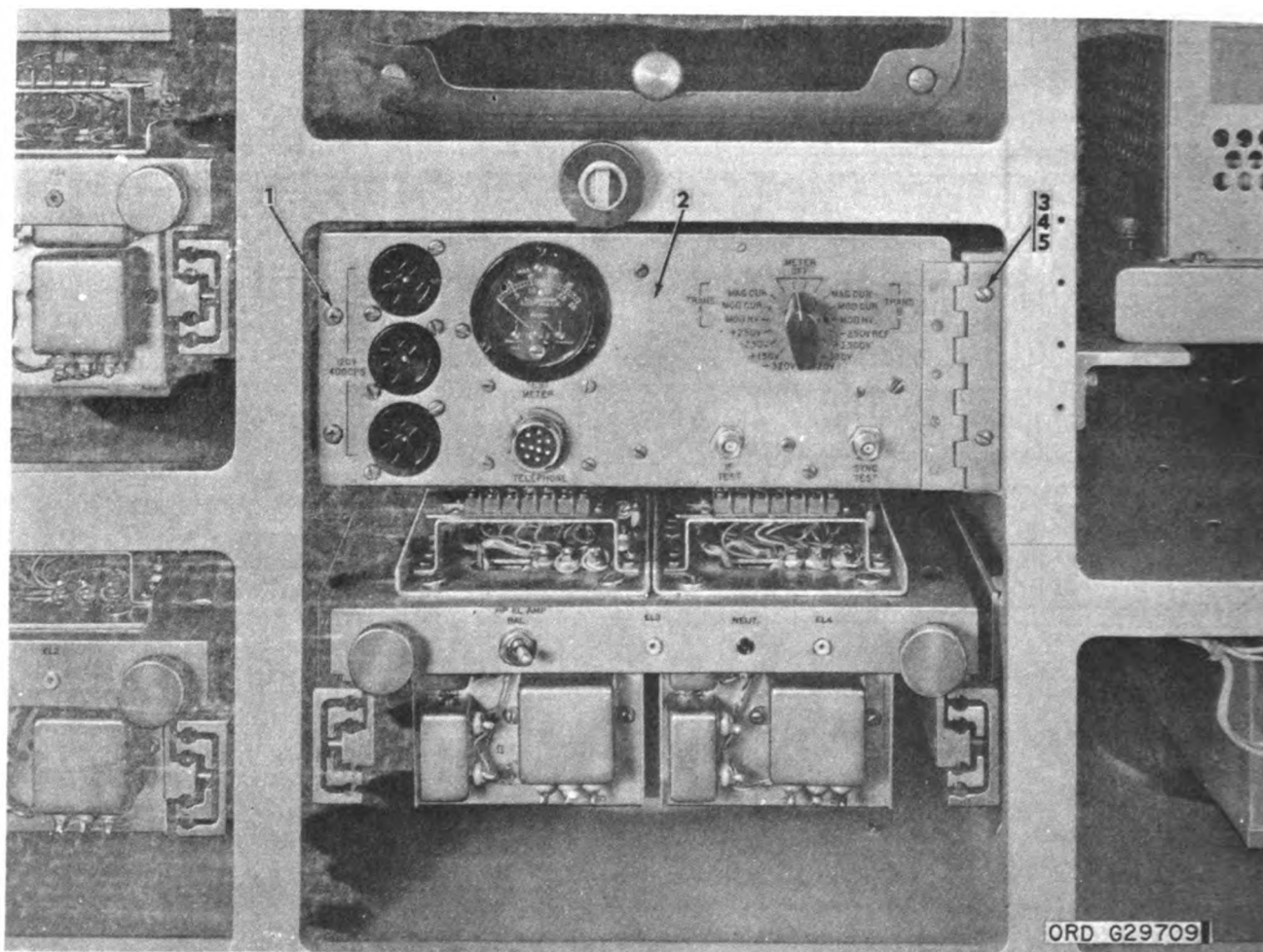
a. Removal.

- (1) Open roadside equipment enclosure door (fig. 49).
- (2) Loosen two fasteners (1, fig. 51), and open meter panel (2).
- (3) Disconnect P1, P2, and P3 from J22B, J21C, and J25, respectively.
- (4) Remove two pan-head screws (3), lock-washers (4), and flat washers (5), and remove meter panel (1).

b. Installation.

(1) Install the meter panel in the reverse order of removal, *a* above.

(2) Perform the radar system transmitter checks in accordance with the track check procedures manual (para 3).



1—Fastener (2)
2—Meter panel

3—No. 10-24 x $\frac{3}{8}$ pan-hd screw
4—No. 10 lockwasher

5—0.281-in. flat washer

Figure 51. Range antenna roadside equipment enclosure—partial interior view.

75. Power Transformer

Warning: The roadside equipment enclosure contains voltages **DANGEROUS TO LIFE**. Turn **TARGET POWER** switch or **MISSILE POWER** switch on radar power control-indicator or **TRR POWER** switch on range-radar-power control-indicator, as applicable, to off position before starting repairs. Discharge capacitors C23 and C24, and C27 on the target—or missile-track antenna-receiver-transmitter, or C17 and C18 on the target-range antenna-receiver-transmitter, as applicable.

86

a. Removal.

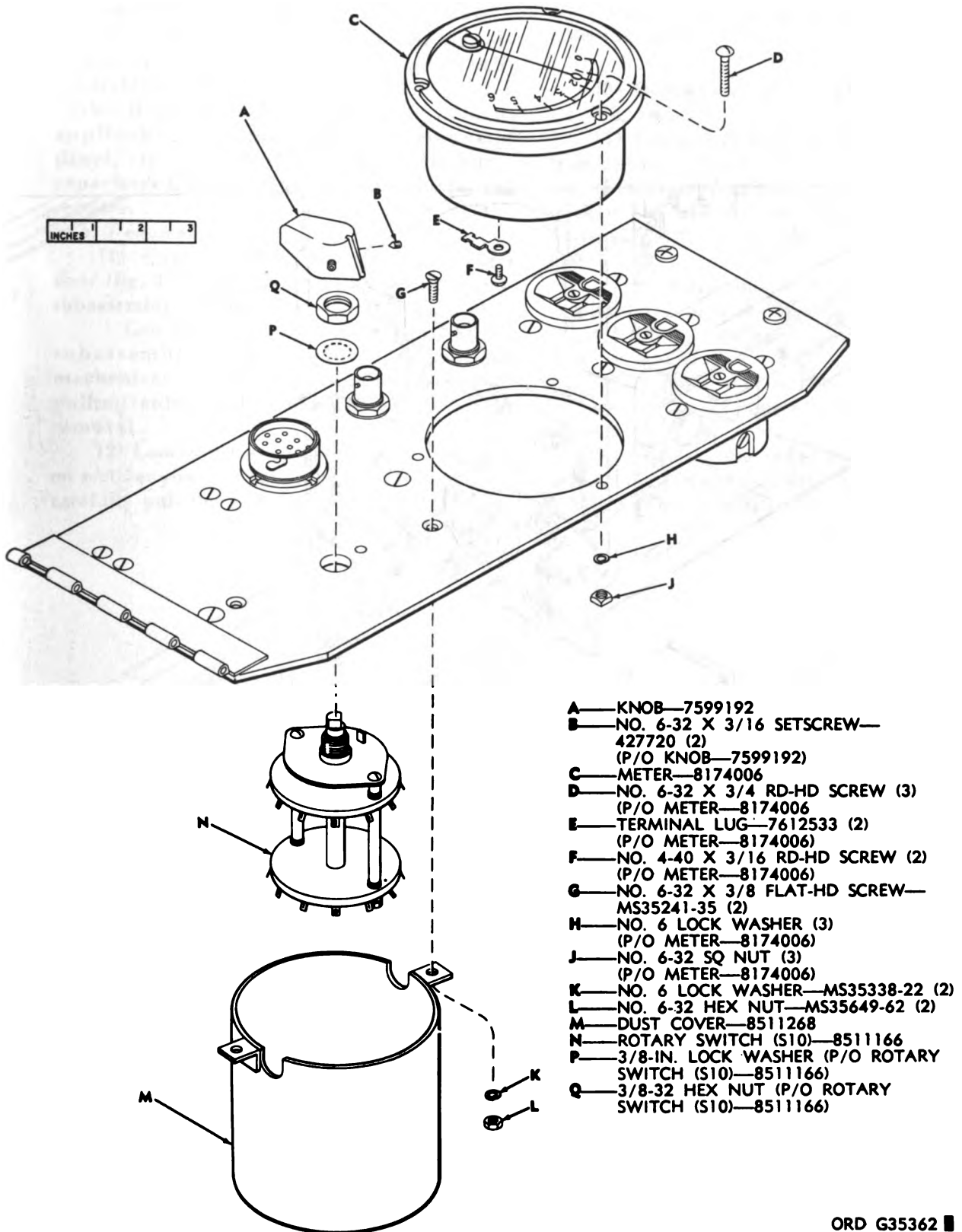
(1) Gain access to the power transformer by swinging the electrical test panel assembly forward (fig. 53).

(2) Tag and disconnect the leads, and remove the power transformer (J).

b. Installation.

(1) Install the power transformer in the reverse order of removal, *a* above.

(2) Perform the radar-system transmitter checks in accordance with the track check procedures manual (para 3).



ORD G35362 ■

Figure 52. Electrical test panel assembly 9005359—partially exploded view.

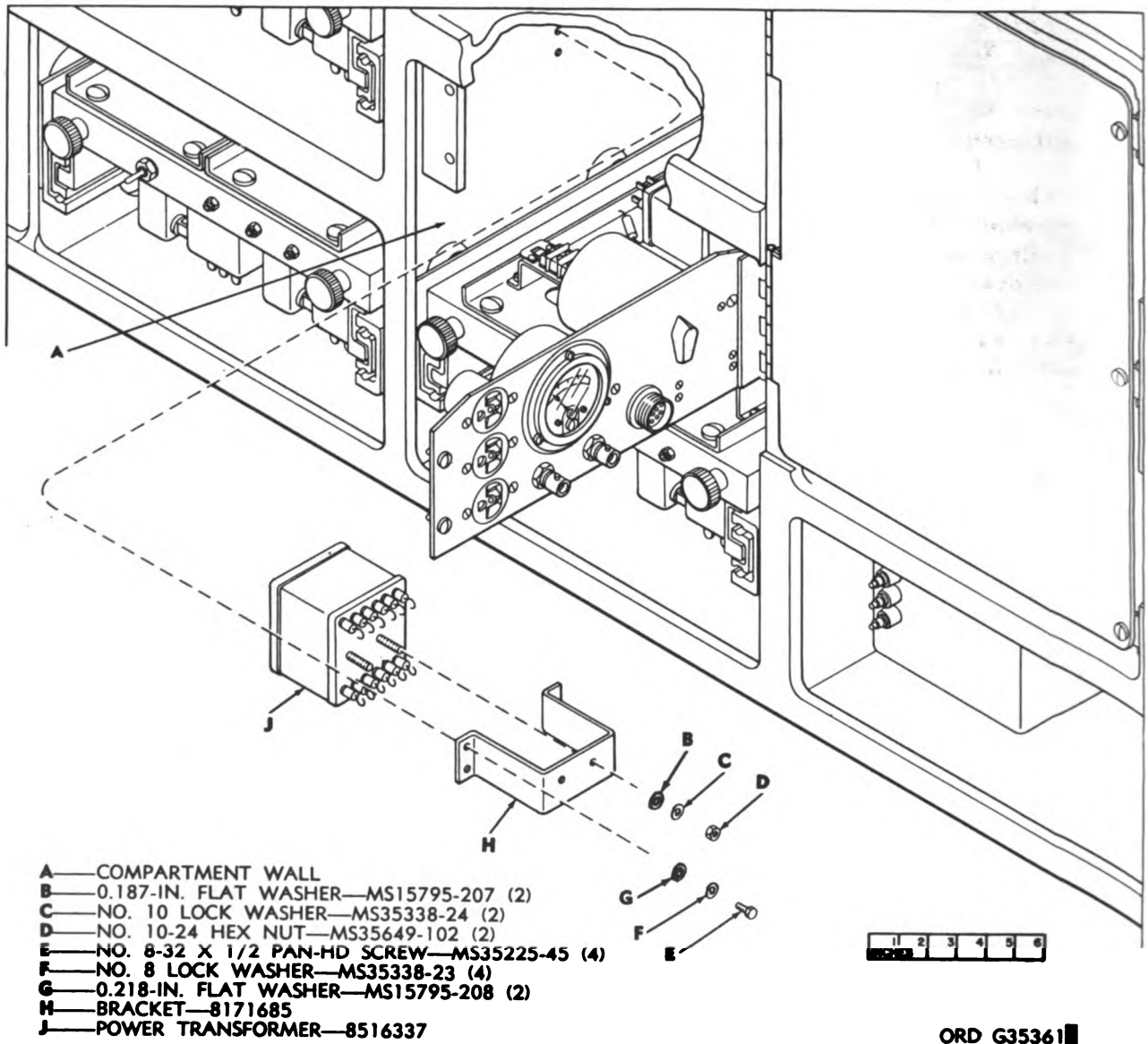


Figure 53. Removal and installation of power transformer.

76. Rectifier Power Supply Subassembly

Warning: The rectifier power supply subassembly contains voltages DANGEROUS TO LIFE. Turn TARGET POWER or MISSILE POWER switch, as applicable, on the radar-power-control panel, to off position, and discharge capacitors C23, C24 and C27 before starting repairs.

a. Removal.

(1) Open roadside equipment enclosure door (fig. 49), and open rectifier power supply subassembly compartment door (A, fig. 50).

Caution: The rectifier power supply subassembly frame does not have mechanical stops. Exercise care to avoid pulling subassembly out too far prior to removal.

(2) Loosen two captive screws (11, fig. 54) on rectifier power supply subassembly (15), and carefully pull the subassembly forward.

Note. Turning the tube holders counterclockwise releases the tubes.

(3) Disconnect, release, and remove tubes V1, V2, and V3.

(4) Disconnect and tag the external leads from terminal board (10).

(5) Remove four hexagon capnuts and lock-washers (14 and 13) and disconnect four black leads (3, 12, 16, and 18) from insulator terminals (17).

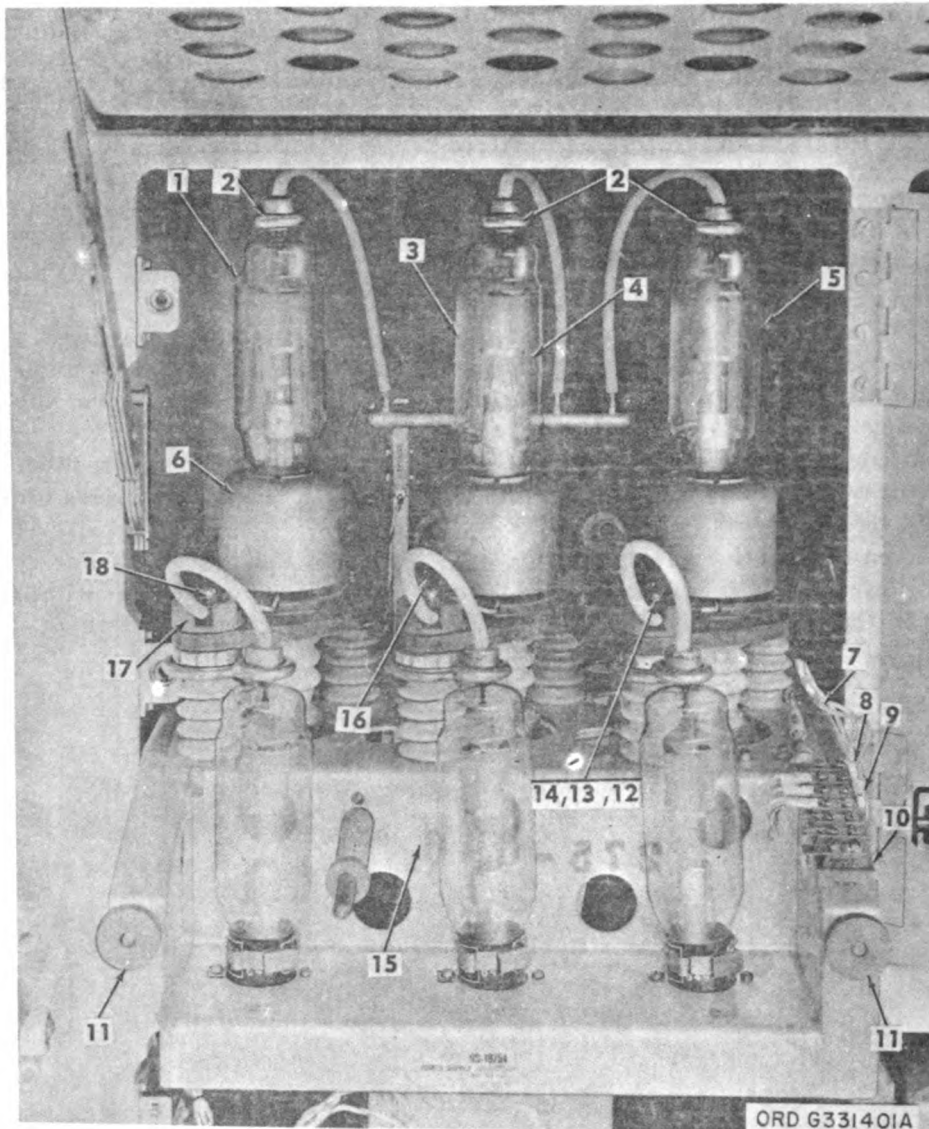
(6) Remove the black leads from the associated thumbscrew clamps (fig. 55).

(7) Remove the power supply subassembly.

b. Installation.

(1) Install the rectifier power supply subassembly in the reverse order of removal, as above.

(2) Perform the radar system transmitter checks in accordance with the track check procedures manual (para 3).



- | | |
|------------------------------|--|
| 1. Electron tube V1 | 10. Terminal board |
| 2. Cap leads (3) | 11. Captive screws (2) |
| 3. Black lead (behind V2) | 12. Black lead |
| 4. Electron tube V2 | 13. No. 10 lockwasher |
| 5. Electron tube V3 | 14. No. 10 hex capnut |
| 6. Electron tube holders (3) | 15. Rectifier power supply subassembly |
| 7. Exterior lead | 16. Black lead |
| 8. Exterior lead | 17. Insulated terminal (3) |
| 9. Exterior lead | 18. Black lead |

Figure 54. Rectifier power supply subassembly—partially extended.

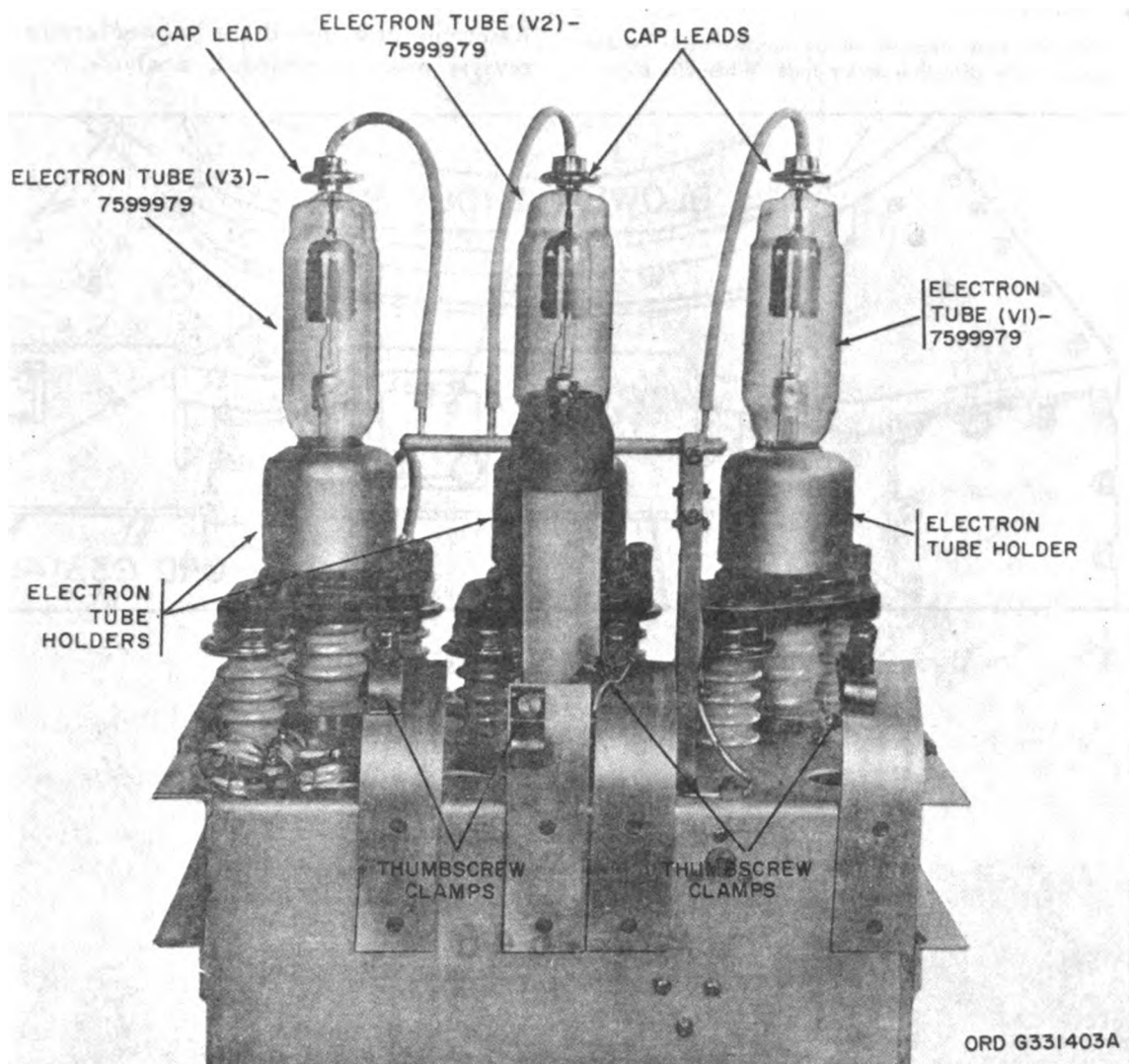


Figure 55. Rectifier power supply subassembly—rear view.

77. Blower Assembly

Warning: All maintenance on the blower assembly shall be performed with **TARGET POWER** or **MISSILE POWER** switch on the radar-power control-indicator or **TRR POWER** switch on range-radar-power control-indicator, as applicable, in the off position.

Note. There are two blower assemblies, B10 located in the front equipment enclosure and B11 (fig. 56) located in the rear equipment enclosure. The following text is applicable to both assemblies:

a. Removal.

(1) Remove eight socket-head screws, lock-washers, and flat washers (H, J, and K, fig. 57) from blower housing assembly (D).

Caution: Support the blower group while performing (2) and (3) below to prevent damage to the leads.

(3) Carefully pull the blower group from the equipment enclosure until the terminal board and loop clamps are accessible.

(3) Disconnect and tag the leads (Q and R). Remove the leads from the loop clamps.

(4) Remove and disassemble the blower group (fig. 57).

b. Installation.

Note. The arrow stamped on the manufacturer's name plate indicates the direction of air flow. When the blower

motor is properly installed, air is pulled from the inside of the antenna.

Assemble and install the blower group in the reverse order of removal, as above.

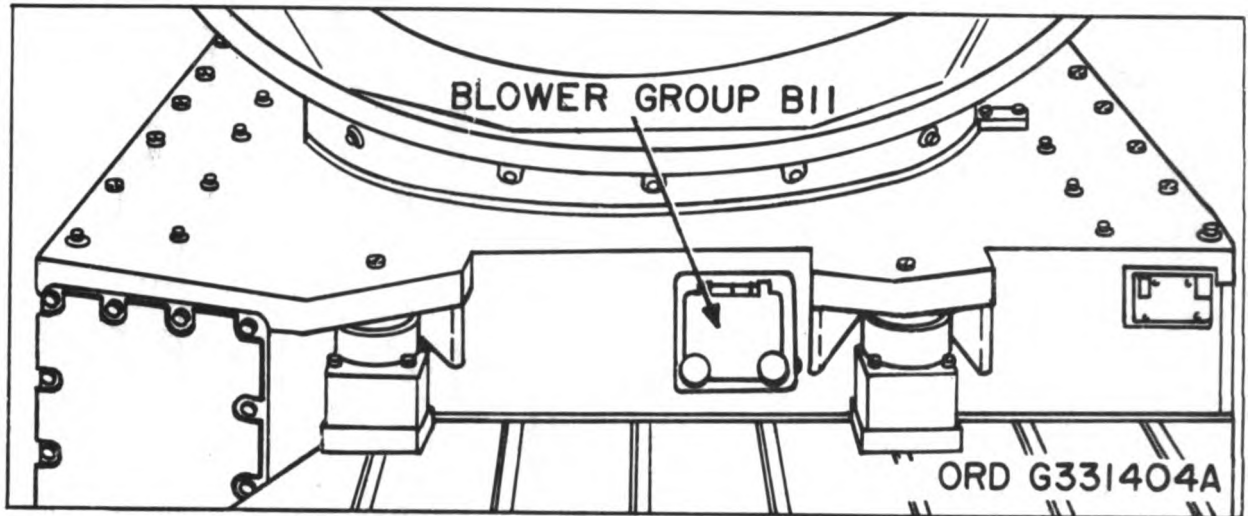
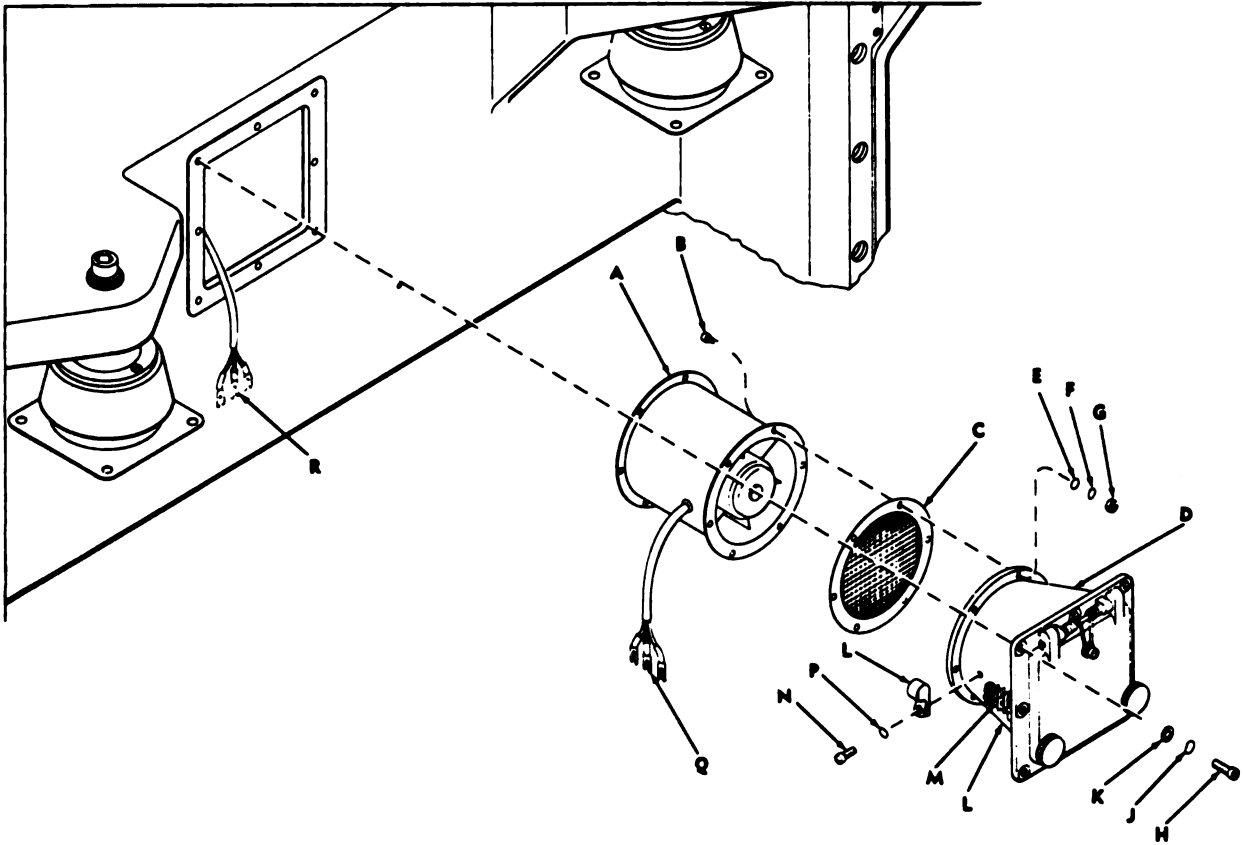


Figure 56. Equipment enclosure—rear view.



ORD G35360 ■

A—Blower assy
 B—No. 10-24 X 7/8 hex-socket-hd screw (6)
 C—Screen
 D—Blower housing assy
 E—0.218-in. flat washer (6)
 F—No. 10 lockwasher (6)
 G—No. 10-24 hex nut (6)
 H—1/4-20 X 1 hex-socket-hd screw (8)

J—1/4-in. lockwasher (8)
 K—9/32-in. flat washer (8)
 L—Loop clamp (2)
 M—Terminal board
 N—No. 8-32 X 7/16 pan-hd screw (2)
 P—No. 8 lockwasher (2)
 Q—Leads
 R—Leads

Figure 57. Blower group B11—partially exploded view.

78. Jack-Leg Assembly

Note. The following text applies to each of the three jack leg assemblies on each radar set (MTR, TTR, and TRR).

a. *Hand-locking Knob and Leg-Lock.* Remove

and install hand-locking knob (F, fig. 59) and leg-lock (H).

Caution: Remove the weight from the jack leg assemblies before removing parts. Install the radar set on the antenna mount

drop-bed trailer in accordance with the assembly and emplacement manual, and allow the legs to hang loose.

b. Coarse Pinion Gear and Adjustment Screw.

(1) Removal.

(a) Loosen the leg-locks (fig. 58).

(b) Remove the twelve sets of hardware (S, R, and Q, fig. 59) securing the cover assembly (T).

(c) Turn the coarse pinion (fig. 58) in the counterclockwise (raise) direction until the cover assembly separates from the jack-leg housing.

(d) Unscrew the cover assembly from tube support (P, fig. 59).

(e) Remove pin (N, fig. 60) from coarse pinion gear (P), and remove the gear from adjustment screw. (Q).

Note. (f) through (i) below are to be performed if the adjustment screw or cover assembly requires maintenance.

(f) Remove six sets of hardware (M, L, and K), and remove the housing (A).

(g) Remove gasket (B), from the housing and seal (C) from the adjustment screw.

(h) Unscrew round nut (D) from the adjustment screw.

(i) Remove washer (E), spacer (F), tapered roller bearings (G), shims (H), and bearing retainer (J) from adjustment screw.

(2) Installation.

(a) Assemble the adjustment screw on the

housing in the reverse order of removal, (i) through (f) above.

Note. (b) below may be necessary if a new coarse pinion gear or a new adjustment screw is installed.

(b) Adjust coarse pinion gear (P) on adjustment screw (fig. 60.1) to obtain a clearance of between 1.248 and 1.252 inches from the housing to the coarse pinion gear. Fix the gear in place with a no. 10-24 X 12 setscrew, obtained from stock. Drill and ream a hole through the coarse pinion gear and adjustment screw suitable for the spring pin (N, fig. 60). Remove the setscrew.

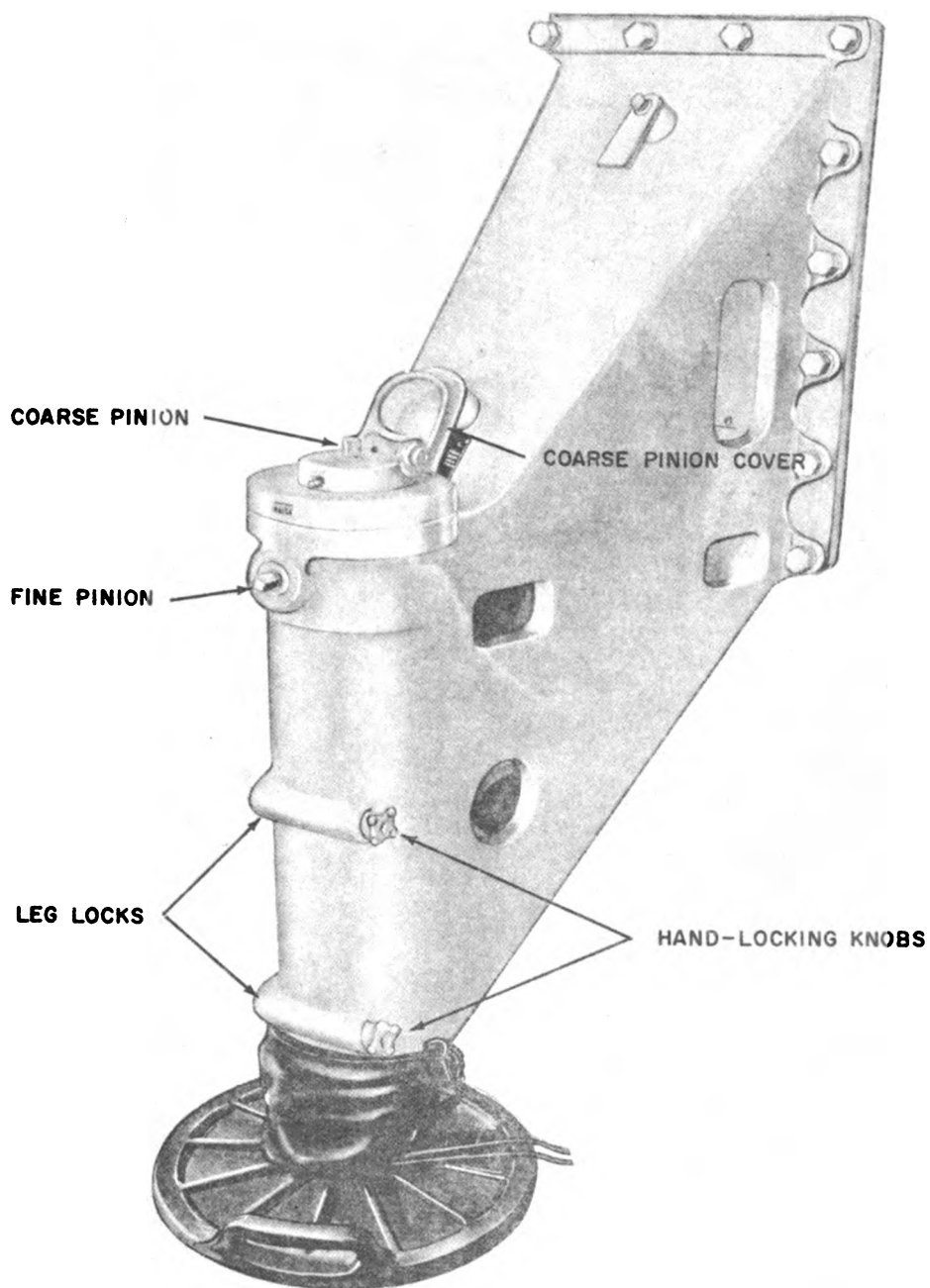
(c) Coat the spring pin with sealer compound 8030-631-5779. Mount the coarse pinion gear on the adjustment screw, and secure with the spring pin (N).

(d) Coat the coarse pinion gear and the threads of the adjustment screw with grease 9150-985-7246, and screw the cover assembly (T, fig. 59) into the tube support (P).

(e) Turn the coarse pinion in a clockwise direction to position the cover assembly firmly on the jack-leg housing. Check to be sure the coarse pinion gear has engaged the fine pinion gear (N).

(f) Secure the cover assembly to the jack-leg housing with the attaching hardware (Q, R, and S).

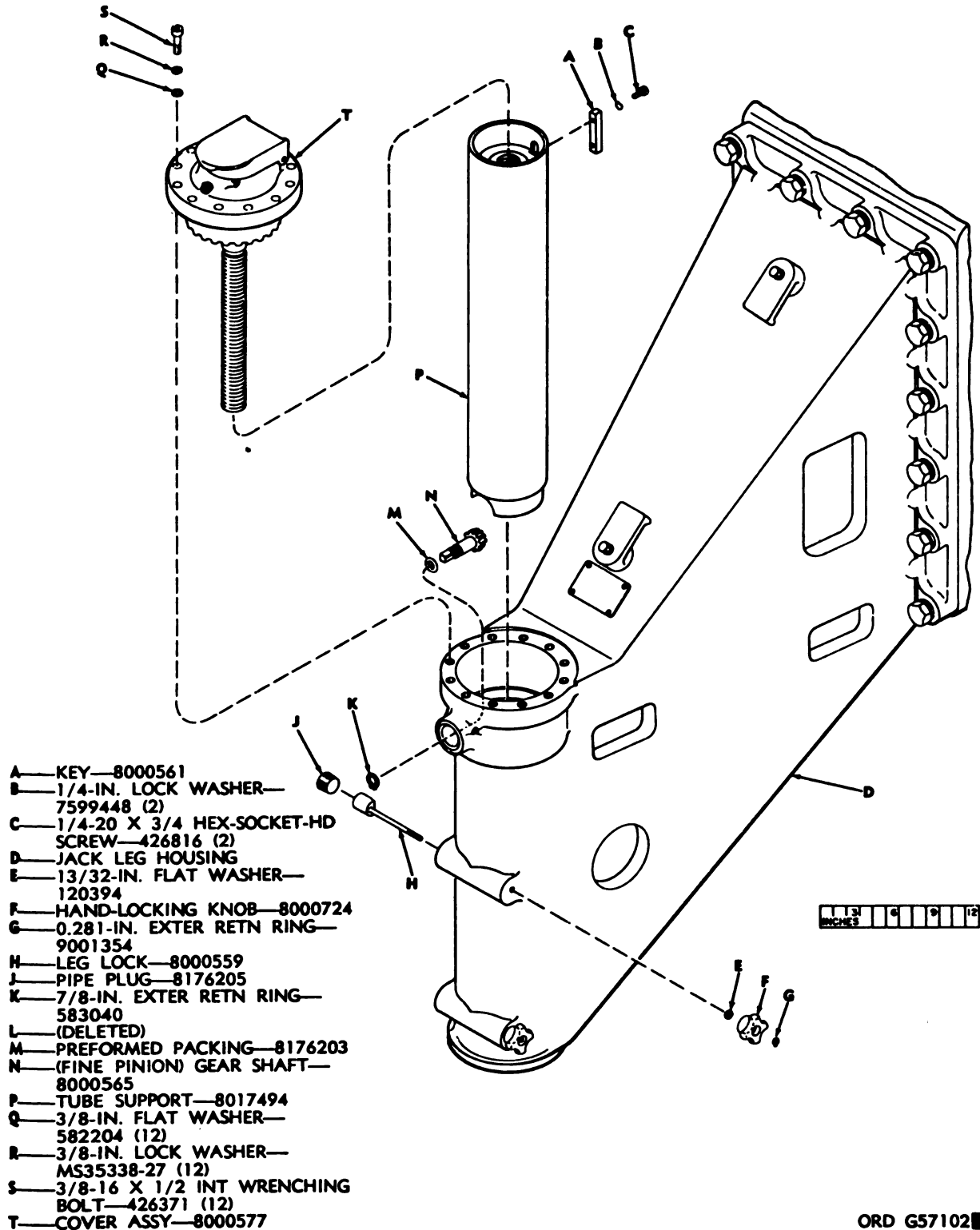
(g) Operate the coarse pinion to determine that the jack-leg assembly is functioning properly.



ORD G331400A

Figure 58. Jack-leg assembly.

C3



ORD G57102

Figure 59. Jack leg assembly—partially exploded view.

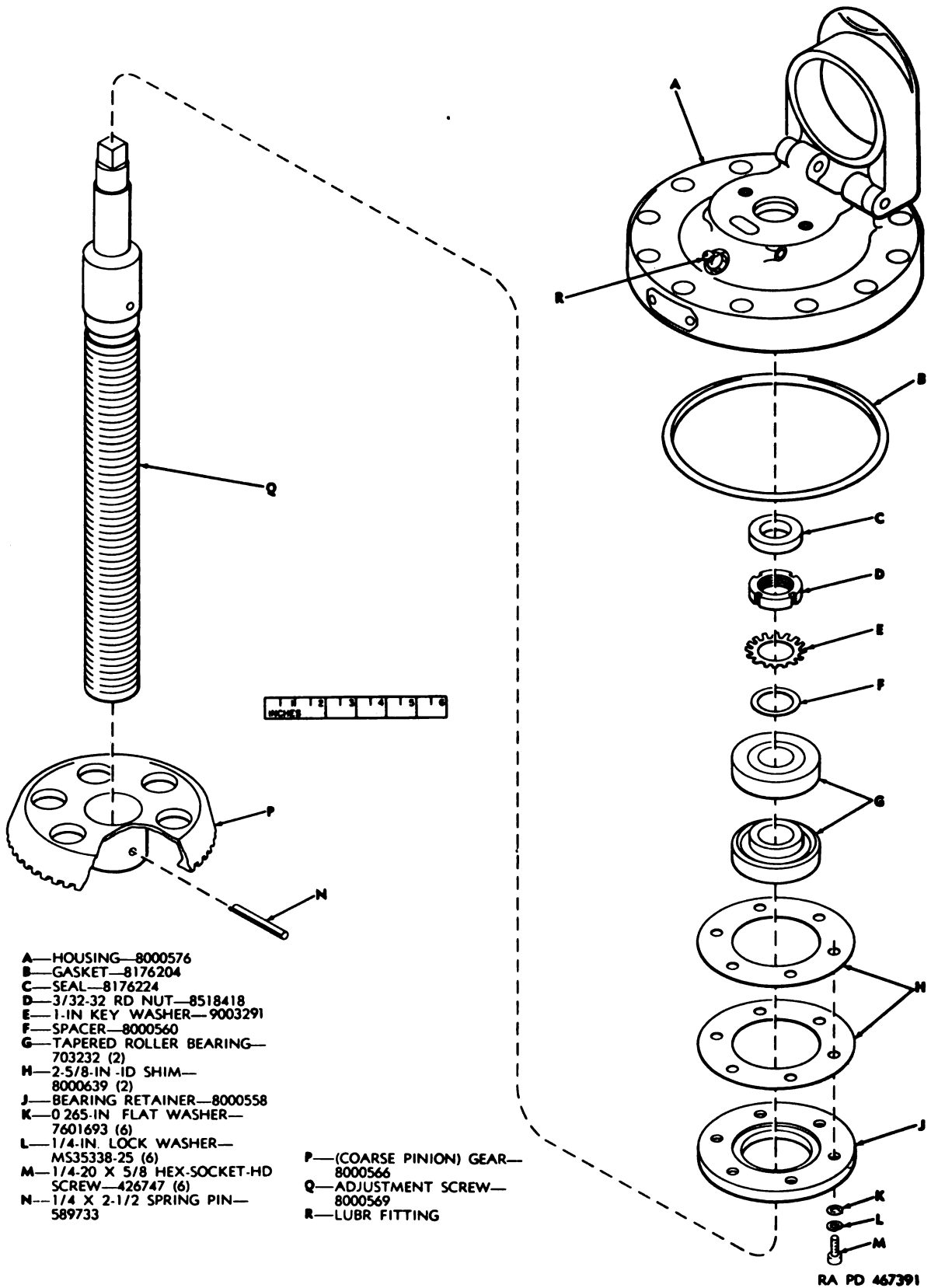


Figure 80. Jack leg cover assembly 8000577—partially exploded view.

c. Fine Pinion Gear and Leg Key.

(1) Removal.

(a) Free the tube support (P, fig. 59) by performing para 78 b (1) (a) through (c) above.

(b) Remove tube support (P), with cover assembly attached, from the jack-leg housing.

(c) Remove key (A) from the tube support.

(d) Remove retaining ring (K), preformed packing (M), and fine pinion gear shaft (N) from jack-leg assembly.

(2) Installation.

(a) Apply a light coat of grease 9150-985-7246 to fine pinion gear shaft (N), and insert the gear in the jack-leg housing.

(b) Secure the fine pinion gear with preformed packing (M) and external retaining ring.

(c) Secure key (A) to tube support (P).

(d) Coat the outside walls of the tube support with grease 9150-985-7246. Aline key (A) with the slot in housing (D), and insert the tube support, with cover assembly (T) attached, into the jack-leg housing.

(e) Secure the cover assembly to the jack-leg housing with the attaching hardware (Q, R, and S).

(f) Operate the coarse and fine pinions to determine that the jack-leg assembly is functioning properly.

d. Assembly.

(1) Support the radar set with the jack legs in accordance with the assembly and emplacement manual (para 3).

(2) Perform the electrical (level) checks (para 11.8).

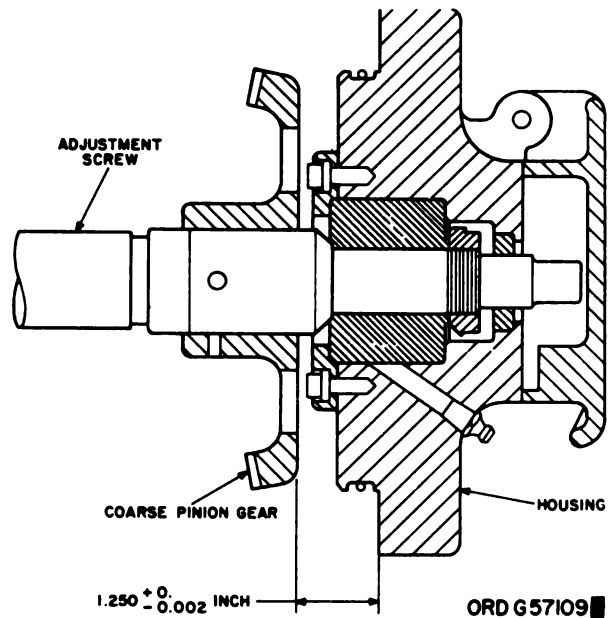


Figure 60.1. Adjustment of coarse pinion gear.

79. Equipment Enclosure Door—Typical

a. Parts Removal.

(1) Open the door, and remove pin (D, fig. 61) from roller arm assembly (E).

(2) Remove roller arm assembly (E), spacer (C), and handle assembly (B) from the door.

Warning: To prevent injury to personnel, support the door while performing (3) below.

(3) Remove retaining ring (L) and flat washer (K) from brace assembly (F).

(4) Remove bearing block (M), and remove sleeve bearing (G) from the bearing block.

b. Disassembly and Assembly.
Disassemble and assemble roller arm assembly (E).

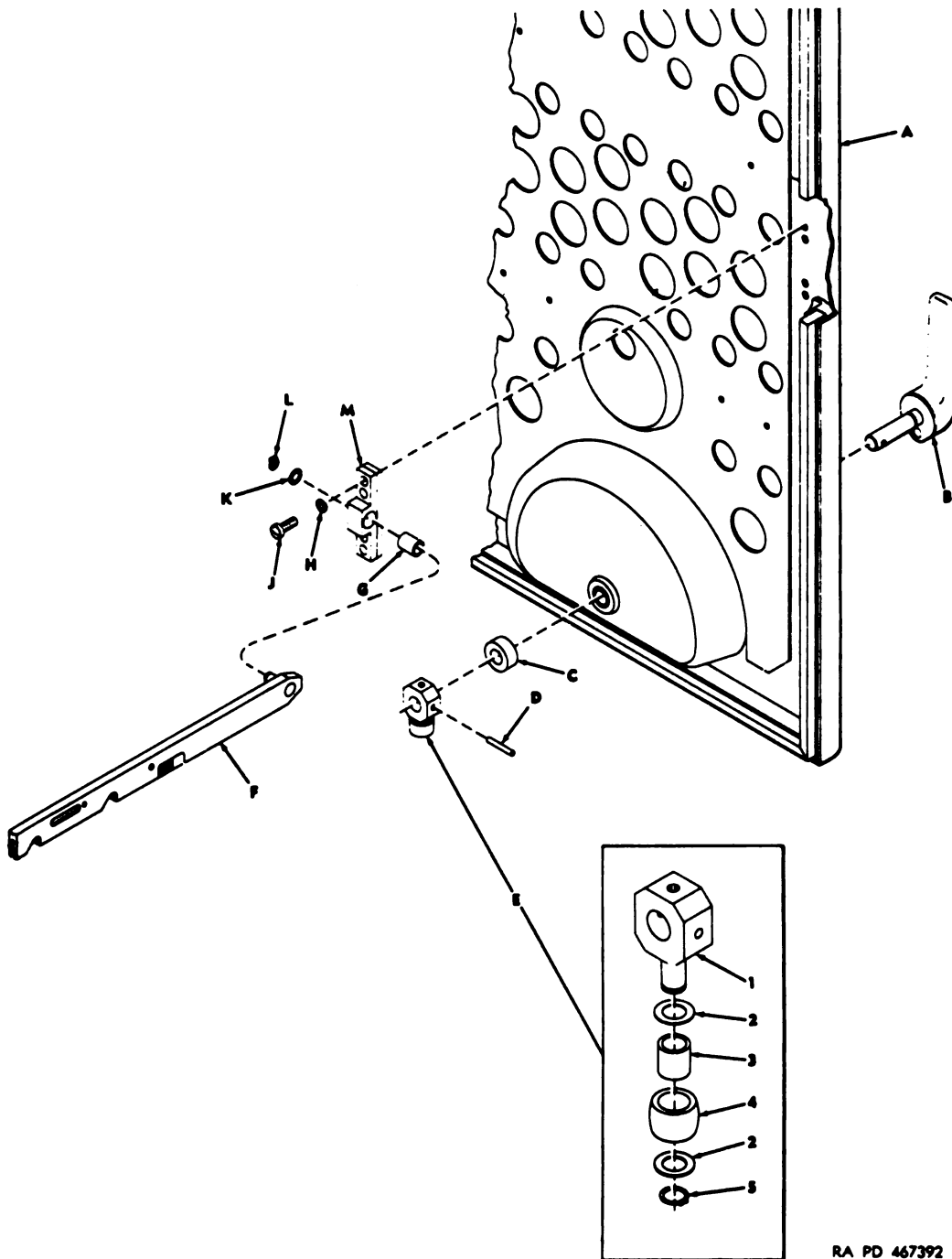
c. Parts Installation.

(1) Coat sleeve bearing (G) with grease 9150-985-7246.

(2) Assemble the sleeve bearing, bearing block (M), flat washer (K), and retaining ring (L) on the brace assembly (F).

(3) Secure the bearing block to the door.

(4) Complete installation by reversing the order of removal a (2) and (1) above.



RA PD 467392

A—Door (partial)

B—Handle assy

C—0.503 X 15 / 32 spacer

D—0.245 X 3/4 straight pin

E—Roller arm assy

1—Arm

2—0.378 X 0.625 X 0.032 flat washer

3—Sleeve bearing

4—Roller

5—3/8-in. exter retn ring

F—Brace assy (partial)

G—Sleeving bearing

H—No. 10 lockwasher

J—No. 10-24 X 3/8 fil-hd screw (4)

K—0.316-in. flat washer

L—5/16-in. exter retn ring

M—Bearing block

Figure 61. Typical enclosure door—partially exploded view.

80. Azimuth Position and Correction Transmitters

Warning: The azimuth-drive-equipment enclosure, the target-track-antenna support base, and the range-antenna support base contain voltages DANGEROUS TO LIFE. Turn TARGET POWER switch or MISSILE POWER switch on radar-power control-indicator or TRR POWER switch on range-radar-power control-indicator, as applicable, to off position before starting repairs.

Caution: The azimuth-position transmitter and azimuth-correction transmitter are heavy and fragile. To prevent damage to the transmitters, more than one man is required to perform the removal and installation procedures.

Note. The azimuth-position transmitter is a part of the MTR and TTR. The azimuth-correction transmitter is a part of the TRR. The minor difference between the position and correction transmitter procedures is indicated in the text.

a. Removal.

(1) Set the ANTENNA switch (fig. 49) to DISABLE.

(2) Remove the radome in accordance with the assembly and emplacement manual (para 3).

(3) Manually set the antenna to the 1600-mil position, and engage elevation lock (fig. 29).

(4) Remove azimuth-position-transmitter access cover (fig. 62).

(5) Manually rotate the antenna pedestal until the top of azimuth-position transmitter (fig. 63) can be viewed through the access opening.

(6) Obtain a rope from the roadside equipment enclosure, and secure to the top of the azimuth-position transmitter (fig. 63).

(7) Remove bottom access cover assembly (R, fig. 64).

Note. The azimuth-correction-transmitter connectors are P10 and P22. See figure 64.1.

(8) Disconnect P16 (W) and P15 (V) from J1 (Q) and J2 (P).

(9) Support the azimuth-position transmitter by means of the rope while removing six hexagon-socket-head screws (T) and lockwashers (U).

(10) Carefully disengage azimuth drive gear (A) from the azimuth-position-transmitter gear, and guide the transmitter while lowering it to the ground.

(11) Install the protective cover over the azimuth-position-transmitter gear (fig. 63).

(12) Remove and store the rope.

b. Installation.

(1) Lubricate azimuth drive gear (A, fig. 64), which meshes with the azimuth-position-transmitter gear in the azimuth-drive-equipment enclosure, with grease 9150-985-7246.

(2) Obtain the rope from the roadside equipment enclosure, and secure to top of azimuth-position transmitter (fig. 63).

(3) Remove protective cover from the azimuth-position-transmitter gear, and secure in the storage position on the position transmitter.

(4) Guide and support azimuth-position transmitter (N) as it is slowly raised to its mounting position by an assistant standing on the antenna pedestal.

(5) Carefully mesh the azimuth drive gear with the azimuth-position-transmitter gear, and secure with six $\frac{3}{8}$ -inch lockwashers (U) and $\frac{3}{8}$ -16 X 1 hexagon-socket-head screws (T).

(6) Connect connectors P16 (W) and P15 (V) to connectors J1 (Q) and J2 (P), respectively.

(7) Install bottom access cover assembly (R).

(8) Remove and store the rope.

(9) Return the equipment to normal operation in the reverse order of the access procedures, a (4) through (1) above.

(10) Perform the special zero-setting check and the radar collimation checks in accordance with the track check procedures manual (para 3).

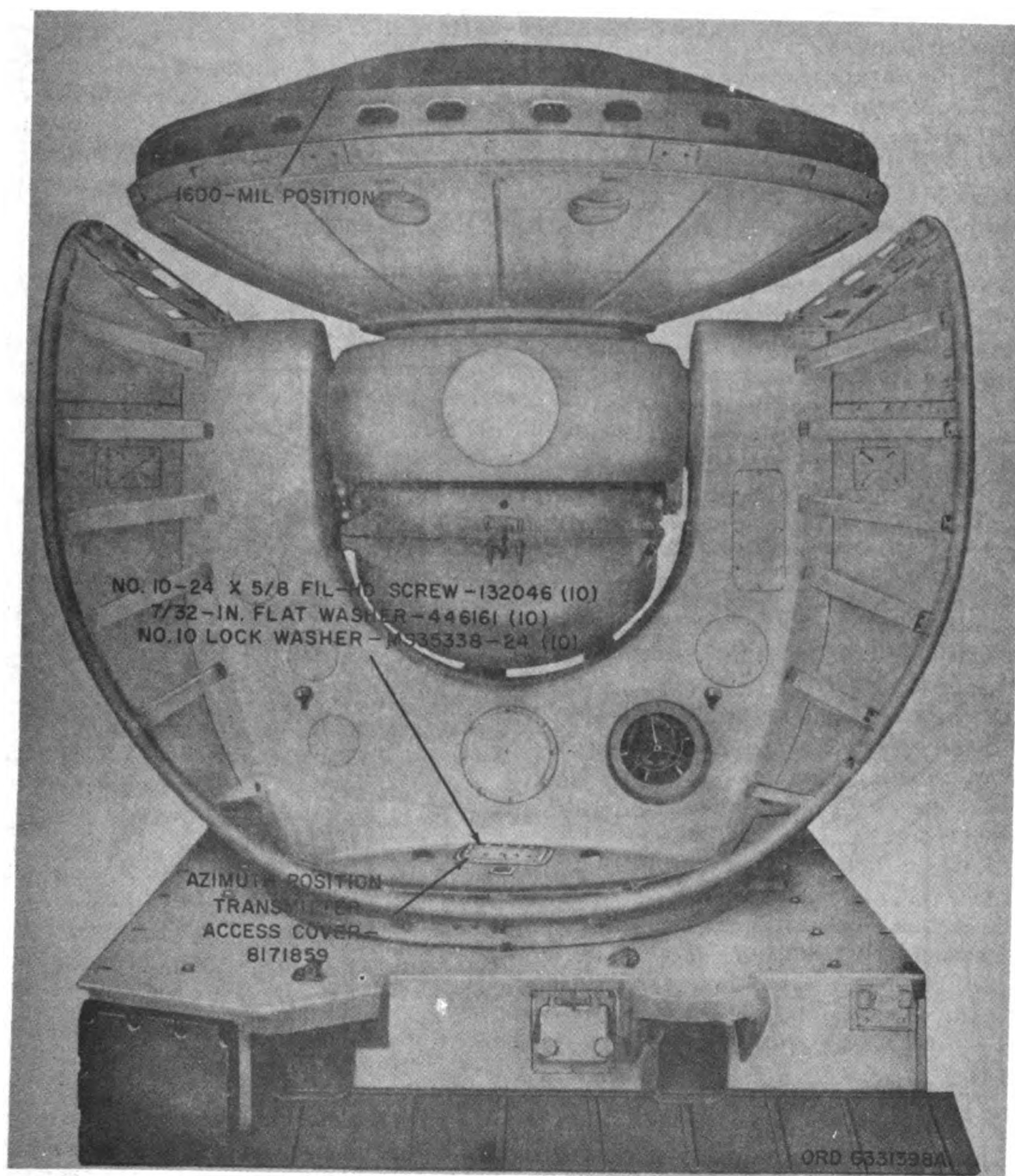


Figure 62. Track antenna pedestal—front view.

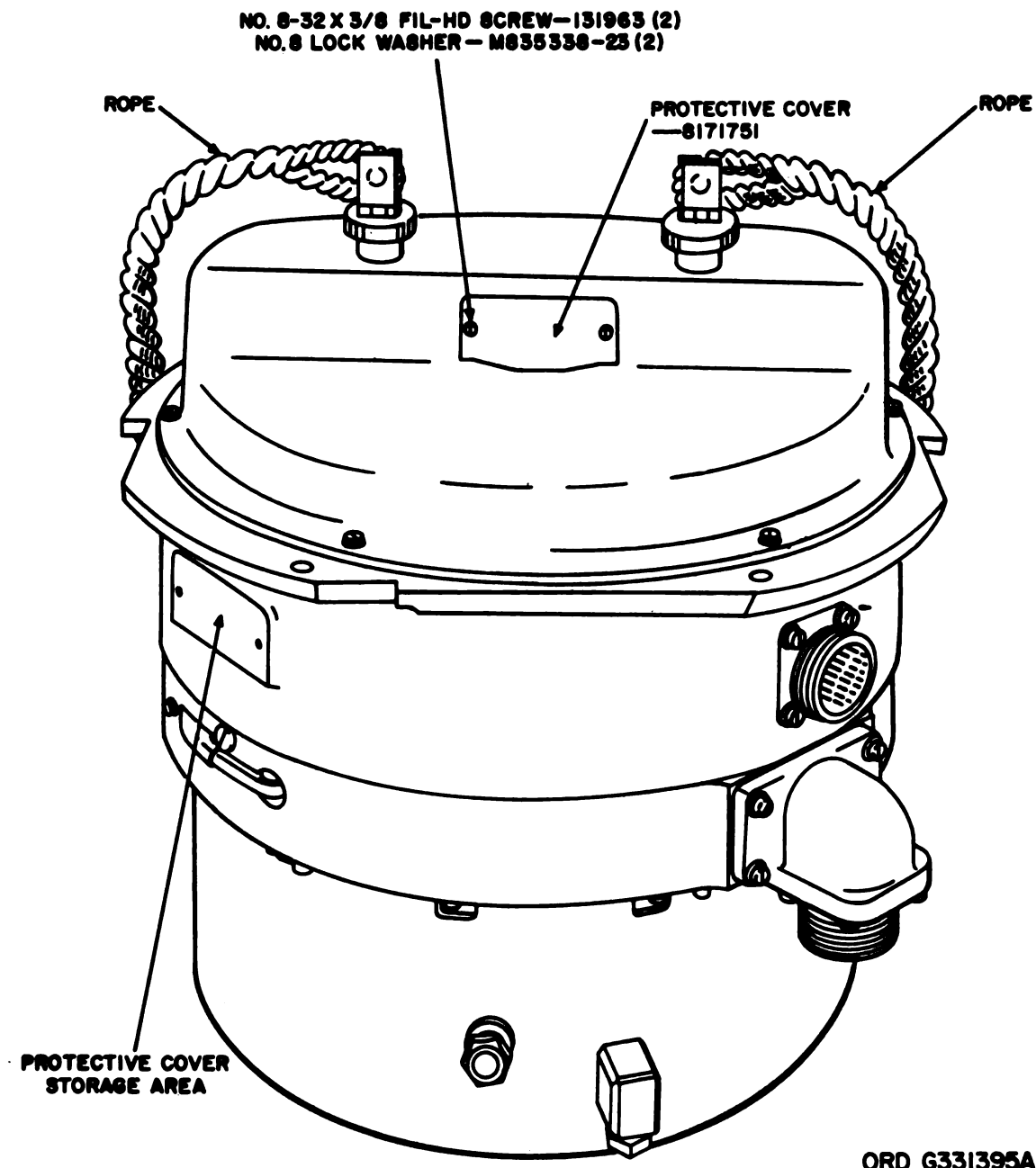
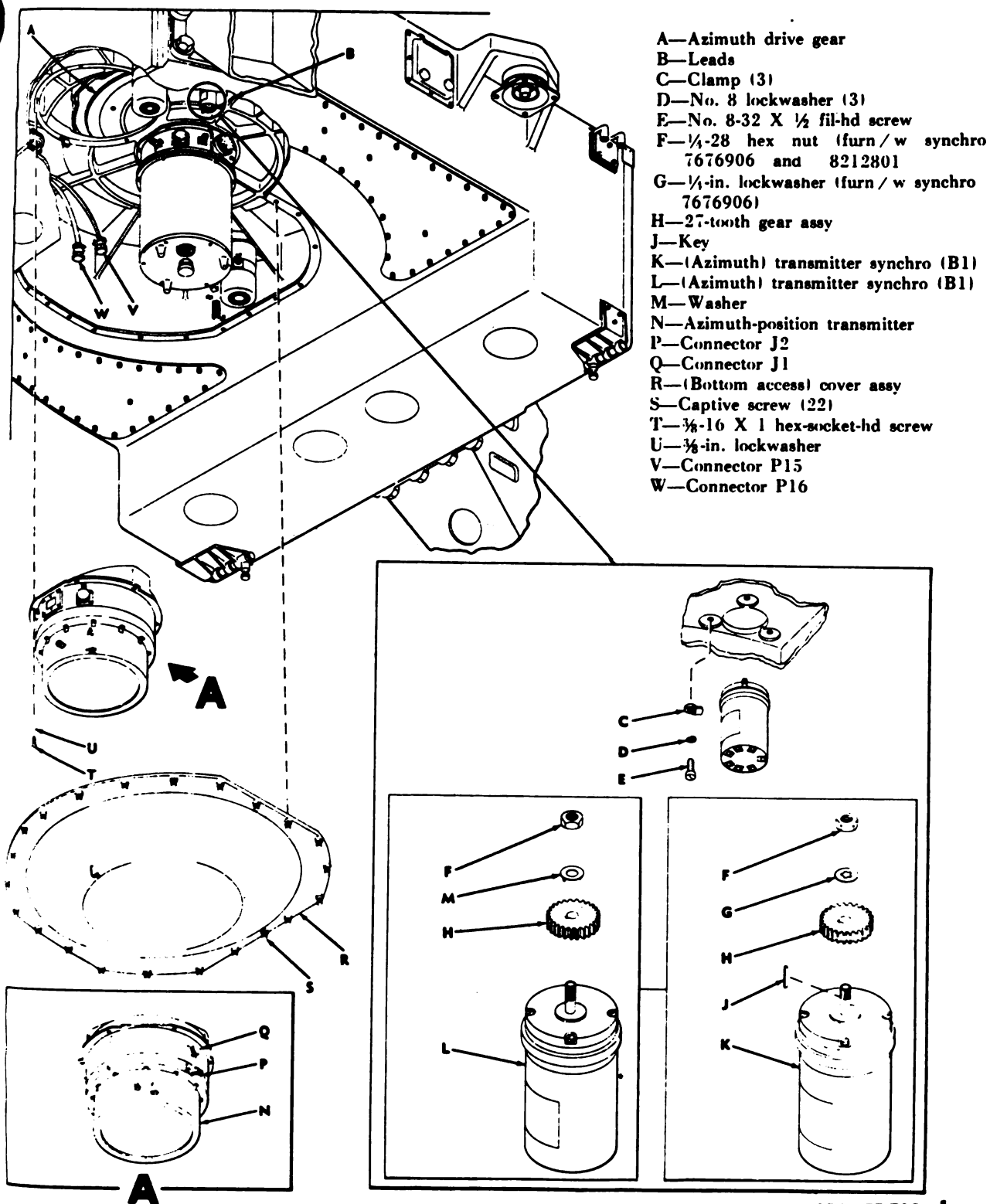
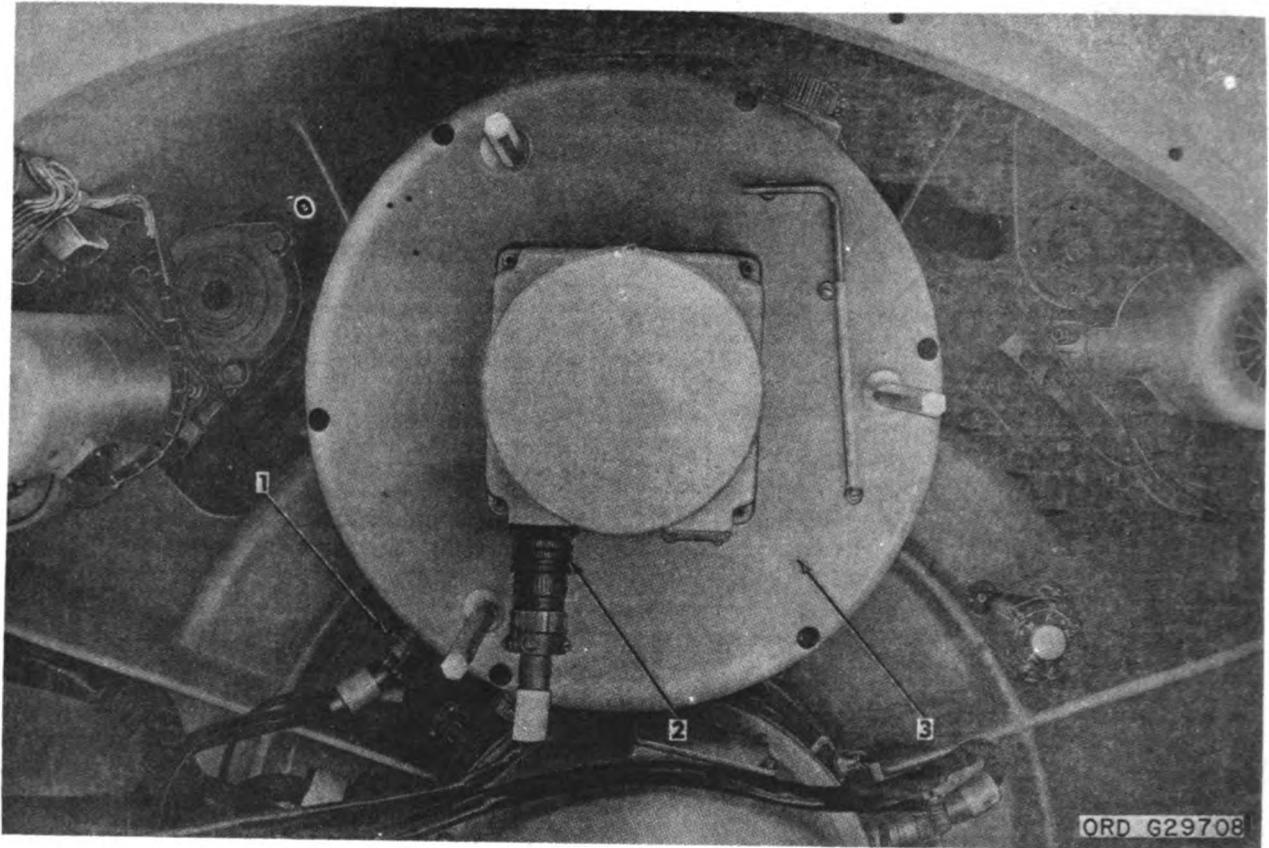


Figure 6.3. Azimuth position transmitter—protective cover and rope installed.



ORD G331702

Figure 64. Azimuth drive equipment enclosure—partially exploded view.



- 1—Connectors P10 and J1
- 2—Connectors P22 and J1
- 3—Azimuth-correction transmitter

Figure 64.1. Azimuth-correction transmitter—locational view.

81. Track and Range Slip Ring Assemblies

Warning: The track and range slip ring assemblies contain voltages **DANGEROUS TO LIFE**. Turn TRR POWER switch on the range-radar-power control-indicator and TARGET POWER, MISSILE POWER and MAIN POWER switches on the radar-power control-indicator to OFF before starting repairs.

Note. Although the following text is written for the TTR and MTR, it is equally applicable to the TRR. The minor differences are mentioned in the text.

a. Removal.

(1) Set the ANTENNA switch (fig. 49) to **DISABLE**.

(2) In the track-antenna pedestal (fig. 29), remove the slip ring access and bottom access cover assemblies.

Note. With the exception of J21, figure 65.1 serves as a locational view for both the track and range slip ring assemblies. J21 is located between J5 and J6 on the range slip ring assembly.

(3) Disconnect and tag all the cables from the slip ring assembly. Used connectors are J1 through J22 and J24.

Warning: The slip ring assembly weighs 125 lbs. Use adequate support.

(4) Support the slip ring assembly while removing five hexagon-socket-head screws (fig. 66) and lockwashers from the slip ring assembly. Remove the slip ring assembly from the azimuth-drive-equipment enclosure.

b. Track Slip Ring Assembly—Testing and Maintenance.

(1) Visually check the center conductor of cable assembly 8517539 and connector 8171940 for arcing.

- (2) Test the cable for a minimum resistance of 1,000 megohms using a megohmmeter.
- (3) Disassembly the slip ring assembly in the sequence of callout numbers shown in figure 65.2.

Note. For further testing of the slip ring assembly, the individual components may be tested for a minimum resistance of 1,000 megohms insulation resistance.

- (4) Reassemble the slip ring assembly in the reverse order of disassembly.

c. Range Slip Ring Assembly—Testing. Using a vacuum tube voltmeter, check the continuity between the following terminals:

J6-A and J14-A	J7-h and J16-F
J6-B and J14-B	J7-j and J15-C
J6-C and J14-C	J7-k and J15-R
J6-D and J14-D	J7-m and J15-M
J6-F and J14-F	J7-o and J16-G
J6-G and J14-G	J7-r and J15-N
J7-A and J19-A	J7-s and J15-Y
J7-B and J19-C	J7-t and J18-U
J7-C and J19-E	J8-A and J18-K
J7-D and J19-F	J8-B and J18-L
J7-E and J18-B	J8-C and J16-C
J7-I and J18-R	J8-D and J16-T
J7-J and J18-C	J8-E and J20-M
J7-K and J19-G	J8-F and J16-A
J7-L and J18-H	J8-G and J18-M
J7-M and J18-T	J8-H and J19-J
J7-M and J18-G	J8-I and J16-D
J7-N and J18-X	J8-K and J20-N
J7-O and J18-J	J8-M and J16-K
J7-P and J15-U	J8-N and J16-R
J7-R and J19-H	J8-O and J22-U
J7-S and J19-I	J8-P and J22-T
J7-T and J15-E	J8-R and J17-C
J7-U and J15-G	J8-S and J16-X
J7-V and J15-H	J8-T and J16-N
J7-W and J15-J	J8-U and J16-V
J7-X and J15-F	J8-X and J17-S
J7-X and J18-Z	J8-Y and J17-B
J7-Y and J18-F	J8-a and J16-Z
J7-Z and J15-A	J8-b and J15-W
J7-a and J22-V	J8-e and J17-R
J7-b and J15-K	J8-f and J17-Y
J7-b and J15-D	J8-g and J16-S
J7-e and J15-Z	J8-h and J18-E
J7-f and J18-Y	J8-j and J18-S
J7-g and J15-B	J8-k and J17-K

J8-m and J17-A	J21-c and J22-c
J8-n and J17-N	J21-d and J22-d
J8-o and J16-E	J21-f and J22-f
J8-p and J20-L	J21-g and J19-M
J8-r and J17-L	J21-j and J22-j
J8-s and J17-W	J24-A and J20-R
J8-t and J17-P	J24-B and J16-B
J21-A and J22-A	J24-C and J20-S
J21-B and J22-B	J24-D and J19-S
J21-C and J22-C	J24-E and J20-B
J21-D and J22-D	J24-F and J20-C
J21-E and J22-E	J24-G and J20-T
J21-F and J22-F	J24-H and J20-U
J21-G and J22-G	J24-H and J16-J
J21-H and J22-H	J24-J and J20-E
J21-I and J22-I	J24-K and J20-J
J21-J and J22-J	J24-L and J20-F
J21-K and J22-K	J24-M and J20-G
J21-M and J22-M	J24-N and J20-H
J21-N and J22-N	J24-P and J20-V
J21-O and J22-O	J24-R and J29-U
J21-P and J22-P	J24-T and J15-X
J21-R and J22-R	J24-U and J16-L
J21-S and J22-S	J24-V and J15-S
J21-T and J15-L	J24-W and J15-T
J21-U and J15-P	J24-X and J20-K
J21-V and J19-P	J1 and J9
J21-W and J22-W	J2 and J10
J21-X and J22-X	J3 and J11
J21-Z and J22-Z	J4 and J12
J21-a and J22-a	J5 and J13

d. Installation.

- (1) Install the slip ring assembly in the reverse order of removal, *a* above.
- (2) Perform the radar system transmitter checks in accordance with the track check procedures manual (para 3).

82. Gearcase Assembly—AC Motor

Warning: The azimuth drive equipment enclosure, target track antenna support base, and range antenna support base contain voltages DANGEROUS TO LIFE. Set the TARGET POWER switch or MISSILE POWER switch on the radar power control-indicator or the TRR POWER switch on the range radar power control-indicator, as applicable, to the off position before starting repairs.

Note. There are four identical gearcase assemblies in the azimuth drive equipment enclosure. The following text is applicable to all these assemblies.

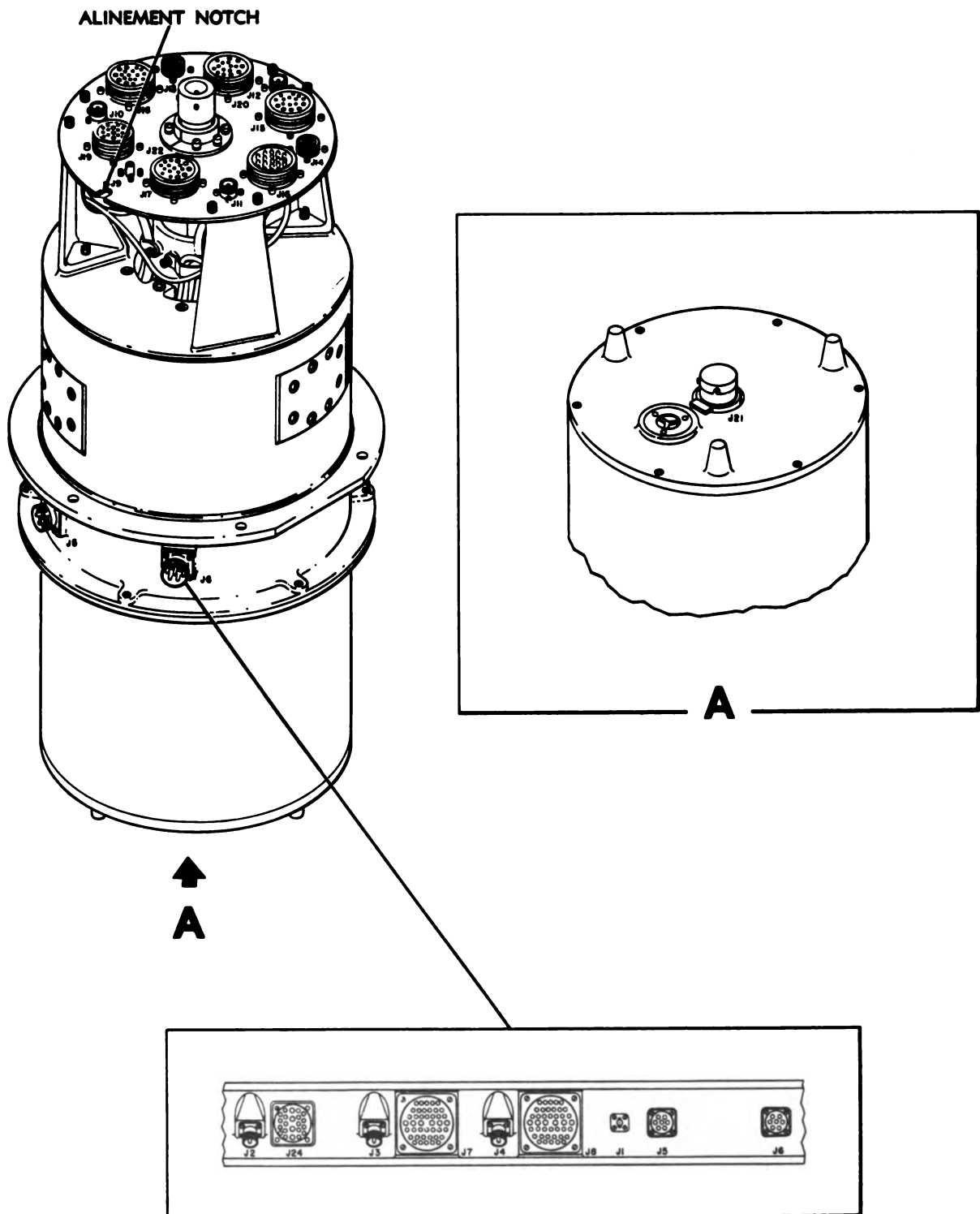
a. Removal.

- (1) Set the ANTENNA switch (fig. 49) to DISABLE.
- (2) Remove bottom access cover assembly (R, fig. 64).
- (3) Disconnect and tag the motor leads from terminal board (P, fig. 67), and remove from the loop clamp.
- (4) Remove four hexagon-socket-head screws (F) and lockwashers (E), and remove ac motor (G).
- (5) Disassemble the ac motor and prepare bearings for grease 9150-00-753-4588.

b. Installation

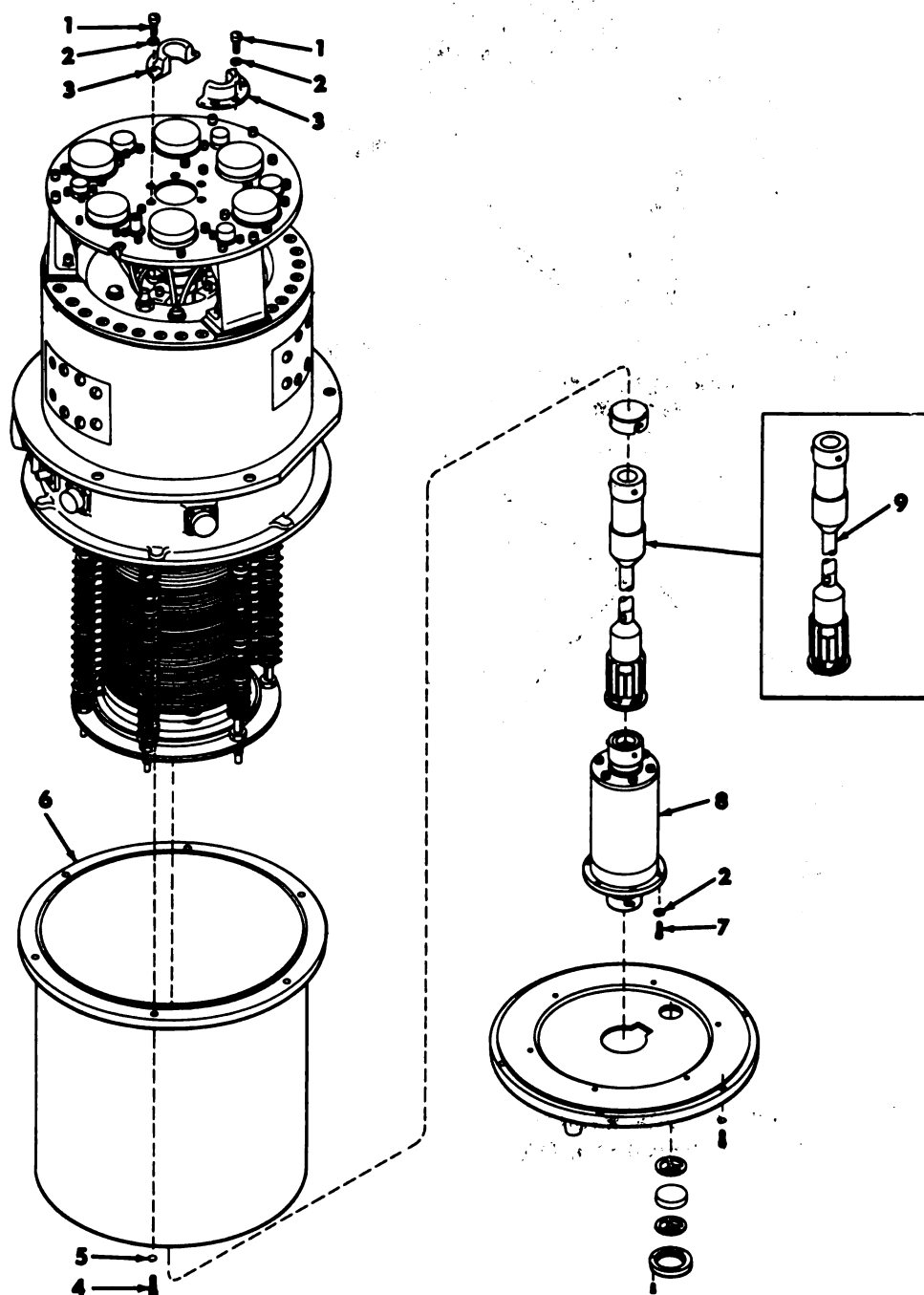
- (1) Coat the exposed gear of ac motor (G) and mating surfaces (H) with grease 9150-00-753-4588.
- (2) Install the ac motor in the reverse order of removal, *a* above.

Figure 65. (Deleted)



ORD G16928

Figure 65.1. Track slip ring assembly - 9009416 - plan view.



ORD G331666

- 1—Screw MS35206-245
- 2—Washer MS35338-23
- 3—Plate 8171945
- 4—Screw MS16997-61
- 5—Washer MS35338-44

- 6—Housing 8171912
- 7—Screw MS16997-33
- 8—Connector assembly 8171940
- 9—Cable assembly 8517539

Figure 65.2. Track slip ring assembly—partially exploded view.

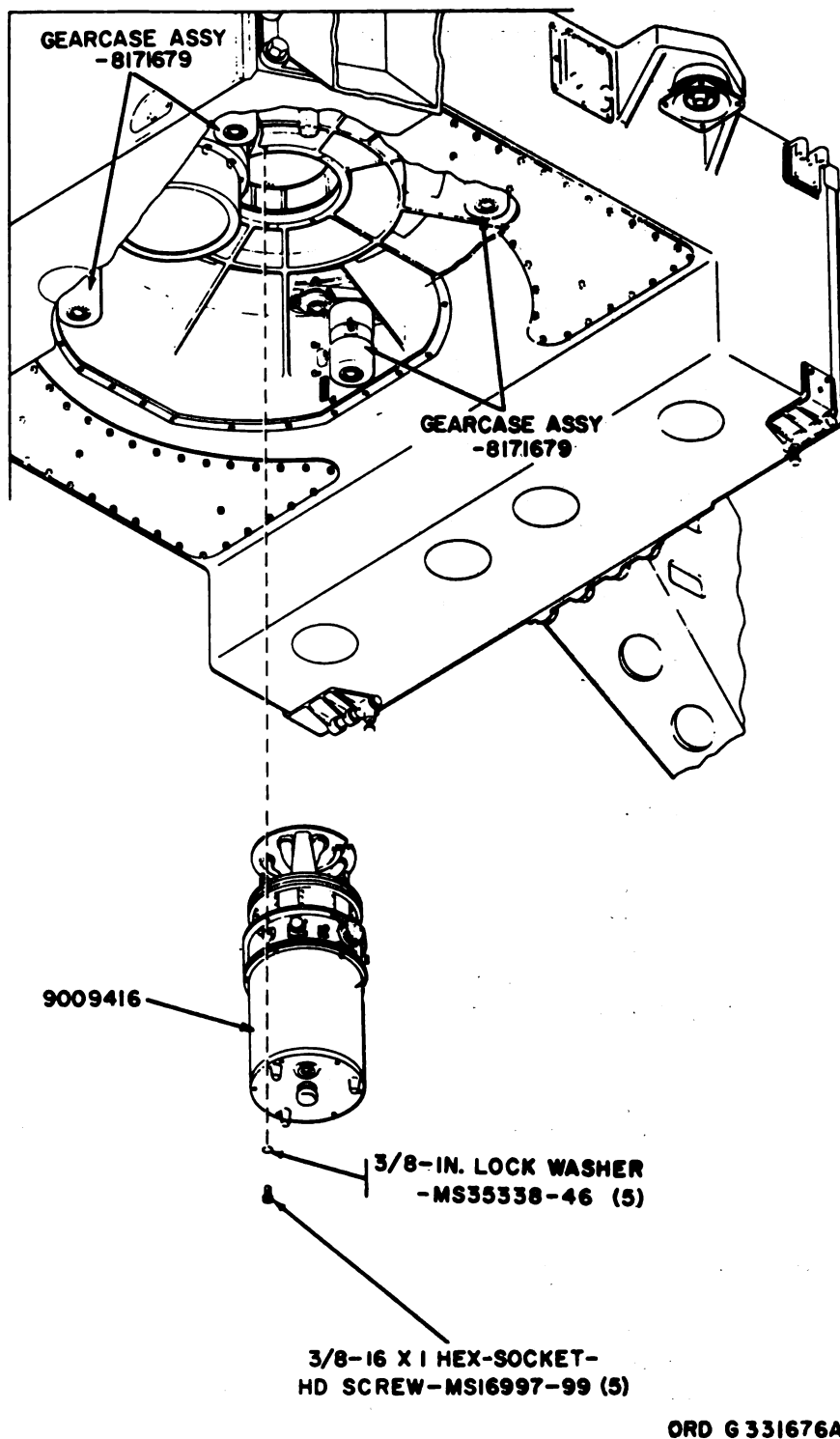
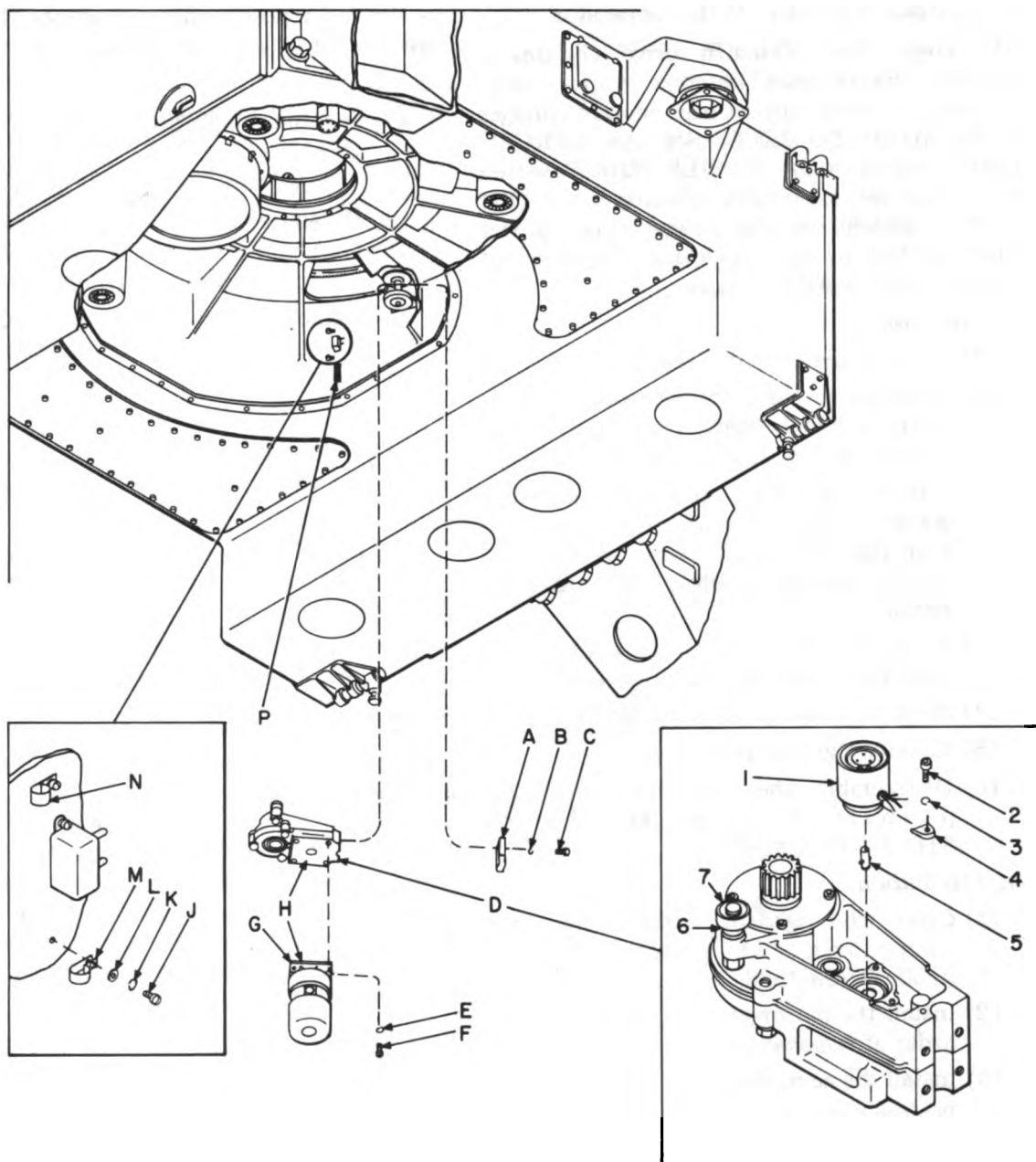


Figure 66. Removal and installation of track slip ring assembly.



ORD G331537

- A**—Gearcase clamp
B—3/8-in. lockwasher (4)
C—3/8-16 X 1 1/4 hex-hd bolt (4)
D—Gearcase Assy
 1—Motor-generator (B3)
 2—No. 8-32 X 1/2 hex-soc-hd screw (4)
 3—No. 8 lockwasher (3)
 4—Clamp (3)
 5—0.285 X 11/16 rigid coupling
 6—Stud
 7—Bearing

- E**—1/4-in. lockwasher (4)
F—5/16-18 X 1 hex-soc-hd screw (4)
G—AC motor (B2)
H—Mating surfaces
J—No. 8-32 X 1/2 fil-h screw (2)
K—No. 8 lockwasher (2)
L—3/16-in. flat washer (2)
M—0.590-in-id loop clamp
N—3/16-in-id loop clamp
P—Terminal board

Figure 67. Removal and installation of gearcase assembly.

83. Gearcase Assembly—Motor Generator

Warning: The azimuth drive equipment enclosure, target track antenna support base, and range antenna support base contain voltages DANGEROUS TO LIFE. Set the TARGET POWER switch or the MISSILE POWER switch on the radar power control-indicator or the TRR POWER switch on the range radar power control-indicator, as applicable, to the off position before starting repairs.

a. Removal.

- (1) Remove the ac motor (para 82).
- (2) Disconnect the motor-generator leads from terminal board (P, fig. 67), and remove the leads from loop clamp (N).

Warning: The gearcase assembly weighs approximately 25 pounds. Provide adequate support for the gearcase assembly before performing (3) below.

- (3) Remove gearcase clamp (A), and carefully lower the gearcase assembly.
- (4) Remove motor-generator (D1).
- (5) Remove rigid coupling (D5).
- (6) Disassemble the motor-generator and prepare bearings for grease 9150-00-753-4588.

b. Installation.

- (1) Coat the mating surfaces of rigid coupling (D5) with grease 9150-00-753-4588.
- (2) Install the motor-generator in the reverse order of removal, *a* above.
- (3) Install the ac motor (para 82b).
- (4) Perform the motor generator phasing adjustments in accordance with the general and preventive maintenance manual (para 3).

84. Azimuth Transmitter Synchro

Warning: The azimuth drive equipment enclosure, target track antenna support base, and range antenna support base contain voltages DANGEROUS TO LIFE. Set the TRR POWER switch on the range radar power control-indicator and the TARGET POWER, MISSILE POWER, and MAIN POWER switches

on the radar power control-indicator to the off position before starting repairs.

a. Removal.

- (1) Set the ANTENNA switch (fig. 49) to DISABLE.
- (2) Remove bottom access cover assembly (R, fig. 64).
- (3) Disconnect and tag leads (B) from azimuth transmitter synchro (K or L).
- (4) Remove clamping hardware (C, D, and E), and remove the transmitter synchro.
- (5) Remove gear assembly (H) from the transmitter synchro.

b. Installation.

- (1) Lubricate 27-tooth gear assembly (H) with grease 9150-00-753-4588.
- (2) Install the transmitter synchro in the reverse order of removal, *a* above.
- (3) Perform the radar collimation checks in accordance with the track check procedures manual (para 3).

85. Eccentric Subassembly

Warning: The azimuth drive equipment enclosure, target track antenna support base, and range antenna support base contain voltages DANGEROUS TO LIFE. Set the TARGET POWER switch or MISSILE POWER switch on the radar power control-indicator or the TRR POWER switch on the range radar power control-indicator, as applicable, to the off position before starting repairs.

a. Removal.

- (1) Set the ANTENNA switch (fig. 49) to DISABLE.
- (2) Enter the pedestal and remove the eccentric subassembly access cover (fig. 29).
- (3) Manually rotate the pedestal until the eccentric subassembly (fig. 68) is beneath the access opening.
- (4) Remove the clamp (fig. 69) from the bracket, and remove the eccentric subassembly with the fitting adapter and lubrication fitting attached.
- (5) Disassemble the eccentric subassembly (fig. 69).

b. Installation.

- (1) Coat the cam roller (fig. 68) of the eccentric subassembly with grease 9150-00-269-8255.

Note. The clearance between the cam roller (fig. 68) of the eccentric subassembly and its running surface must be between 0.003 and 0.005 inch. Check and adjust this clearance as necessary while installing the eccentric subassembly.

- (2) Observing the clearance noted above, install the eccentric subassembly (fig. 69).
- (3) Assemble the fitting adapter and the lubrication fitting to the eccentric subassembly, and fill lubrication fitting with grease 9150-00-269-8255.
- (4) Complete installation in the reverse order of removal, *a* (2) and (1) above.

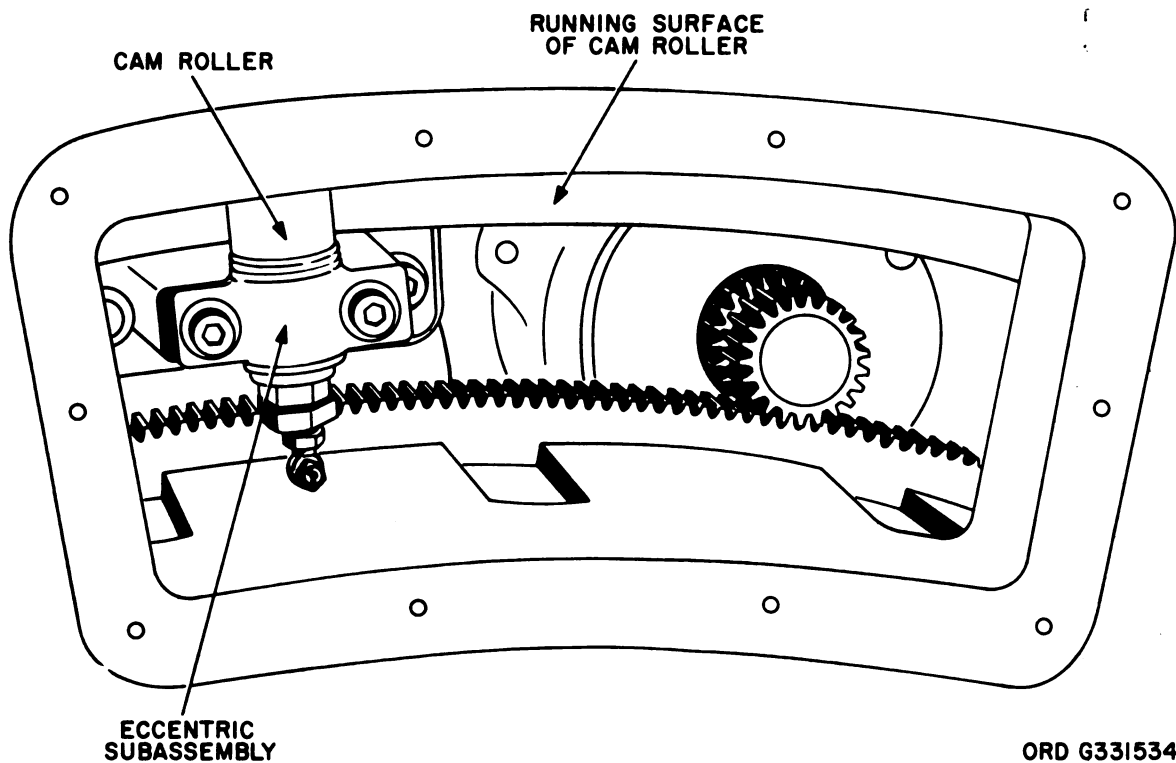


Figure 68. Eccentric subassembly—access cover removed.

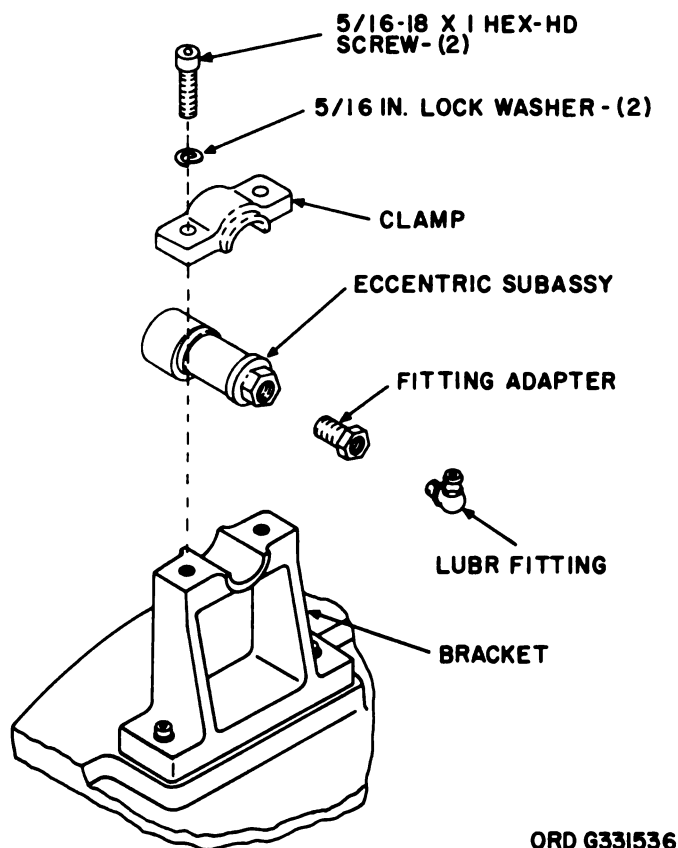


Figure 69. Removal and installation of eccentric subassembly.

86. Cable Assembly

Warning: The azimuth drive equipment enclosure and the target track antenna support base contain voltages DANGEROUS TO LIFE. Turn the TARGET POWER switch or the MISSILE POWER switch, as applicable, on the radar power control-indicator to the off position, and discharge capacitors C23, C24, and C27 before starting repairs.

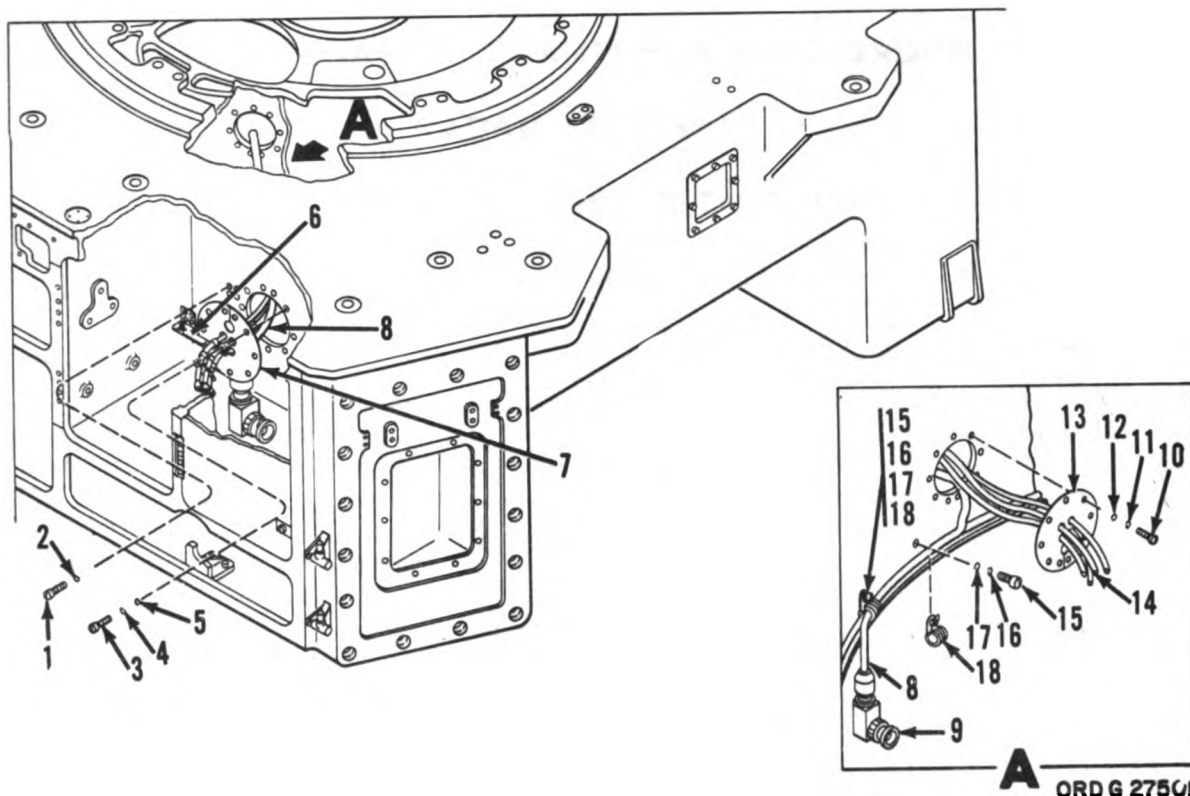
a. Removal.

- (1) Open the roadside equipment enclosure door (fig. 49), and open transformer and filter power supply subassembly compartment door (D, fig. 50).
- (2) Remove the transformer and filter power supply subassembly in accordance with the operator and organizational maintenance manual (para 3).

Note. In some systems, cover (7, fig. 70) and gasket (13) have only a single cable hole (slot). In these systems, removal of bracket group (6) and associated hardware (1 and 2) is not required. In addition, in these systems the cover

and gasket may be removed for more convenient cable access.

- (3) Remove four pan-head screws and lockwashers (1 and 2). Remove nine pan-head screws, lockwashers, and flat washers (3, 4, and 5). Move bracket group (6) and cover (7) forward. Remove cable assembly (8) from the cover.
- (4) Remove bottom access cover assembly (R, fig. 64).
- (5) Disconnect P10 (9, fig. 70) from J21.
- (6) Remove nine pan-head screws, lockwashers, and flat washers (10, 11, and 12). Remove the cable assembly from gasket (13). Move the gasket and RF cables (14) away from the cable assembly.
- (7) Remove two loop clamps (18), and remove the cable assembly from the azimuth-drive-equipment enclosure.



- 1—No. 10-24 x $\frac{5}{16}$ pan-hd screw (4)
- 2—No. 10 lockwasher (4)
- 3—No. 10-24 x $\frac{5}{16}$ pan-hd screw (9)
- 4—No. 10 lockwasher (9)
- 5—7/16-in. flat washer (9)
- 6—Bracket group
- 7—Cover
- 8—Cable assy
- 9—Connector P10

- 10—No. 10-24 x $\frac{5}{16}$ pan-hd screw (9)
- 11—No. 10 lockwasher (9)
- 12—7/16-in. flat washer (9)
- 13—Gasket
- 14—RF cables (4)
- 15—No. 8-32 x $\frac{1}{2}$ pan-hd screw 8305-043-6695 (2)
- 16—No. 8 lockwasher (2)
- 17—3/16-in. flat washer (2)
- 18—Loop clamp (2)

Figure 70. Removal and installation of cable assembly.

b. Installation.

(1) Insert the cable assembly through the gasket, and connect P10 to J21. Position the cable as near as convenient to the installed position.

(2) Install the cable assembly in the reverse

order of removal, a above.

(3) Perform the radar-system transmitter checks in accordance with the track check procedures manual (para 3).

87-101. (Deleted)

Figure 71. (Deleted).

CHAPTER 5 (Deleted)

(Next numbered page is 112.11)

CHAPTER 6

MAINTENANCE OF ANTENNA-MAST GROUP, RADAR TEST SET, AND RADAR TEST SET GROUP

Section I. GENERAL

131. Configurations

There are two configurations of the radar test set, as used with the Basic system (fig. 76), or as used with the Improved and ATBM systems (fig. 77). Refer to the component configuration TB (para 3) for a list of assemblies and subassemblies used with each system.

132. Assembly and Disassembly

With the exception of components within the radar test set and RF detector, assembly and disassembly instructions for the two configurations are provided in the assembly and emplacement manual (para 3).

Table 8. (Deleted).

Sections II and III. (Deleted).

Section IV. RADAR TEST SET

Warning: The radar test set contains voltages **DANGEROUS TO LIFE**. Turn power switch on the RF power meter panel to OFF.

141. Equipment Drawer-Removal

a. Disconnect four snap fasteners (2A, fig. 78)

that secure cover assembly (2B) to cabinet (2C).

b. Raise cover assembly (2B); slide it to the right until hinges (2D) are disengaged; and remove the cover assembly from the cabinet.

c. Loosen four externally relieved body screws (2E) that secure bracket group (1A) to cabinet (2C).

d. Unscrew two bolt locks (2F) to release rail slide assemblies (2G and 2H).

e. Slide equipment drawer (1) out of cabinet.

f. Disconnect receptacle connector (2J) from its receptacle connector (1B) on equipment drawer.

g. Remove four hexagon-socket screws (1C), lockwashers (1D), and flat washers (1E) and lift equipment drawer (1) from rail slide assemblies (2G and 2H).

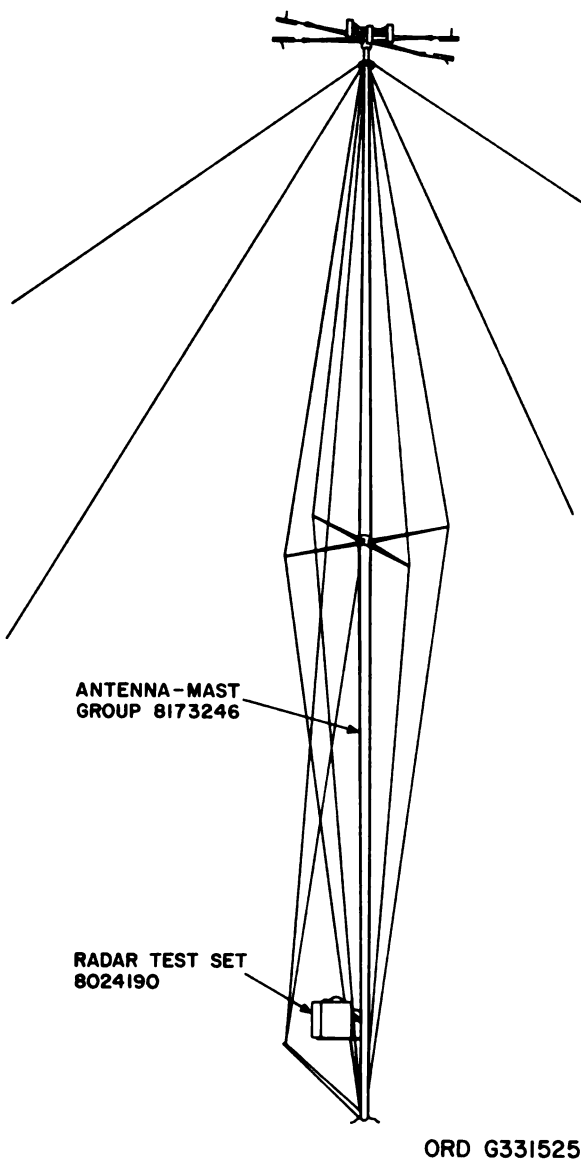


Figure 76. Antenna mast group 8173246 and radar test set 8024190.

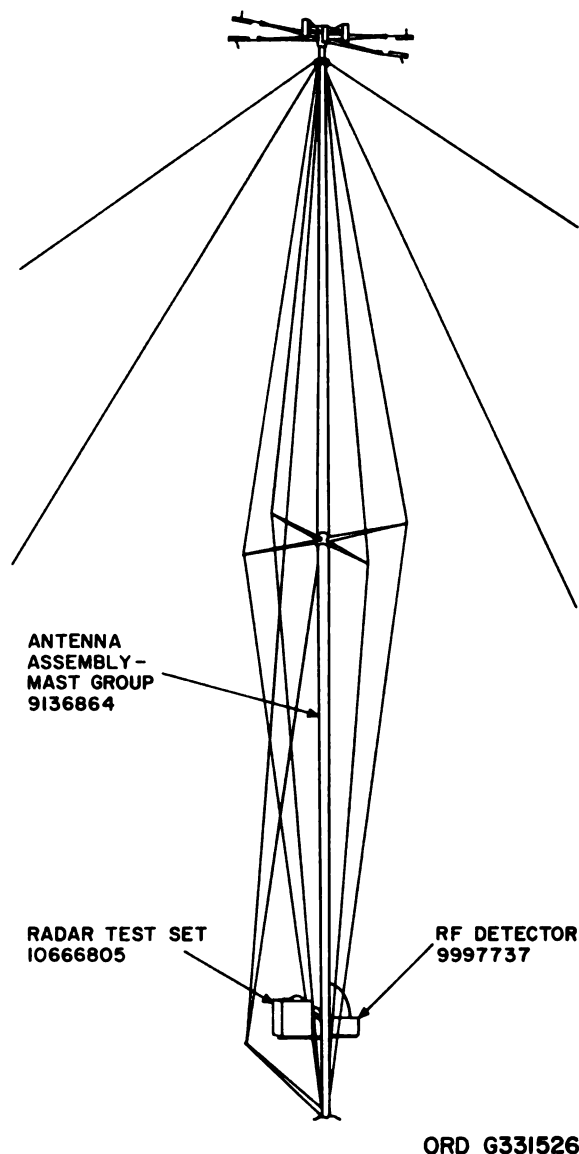


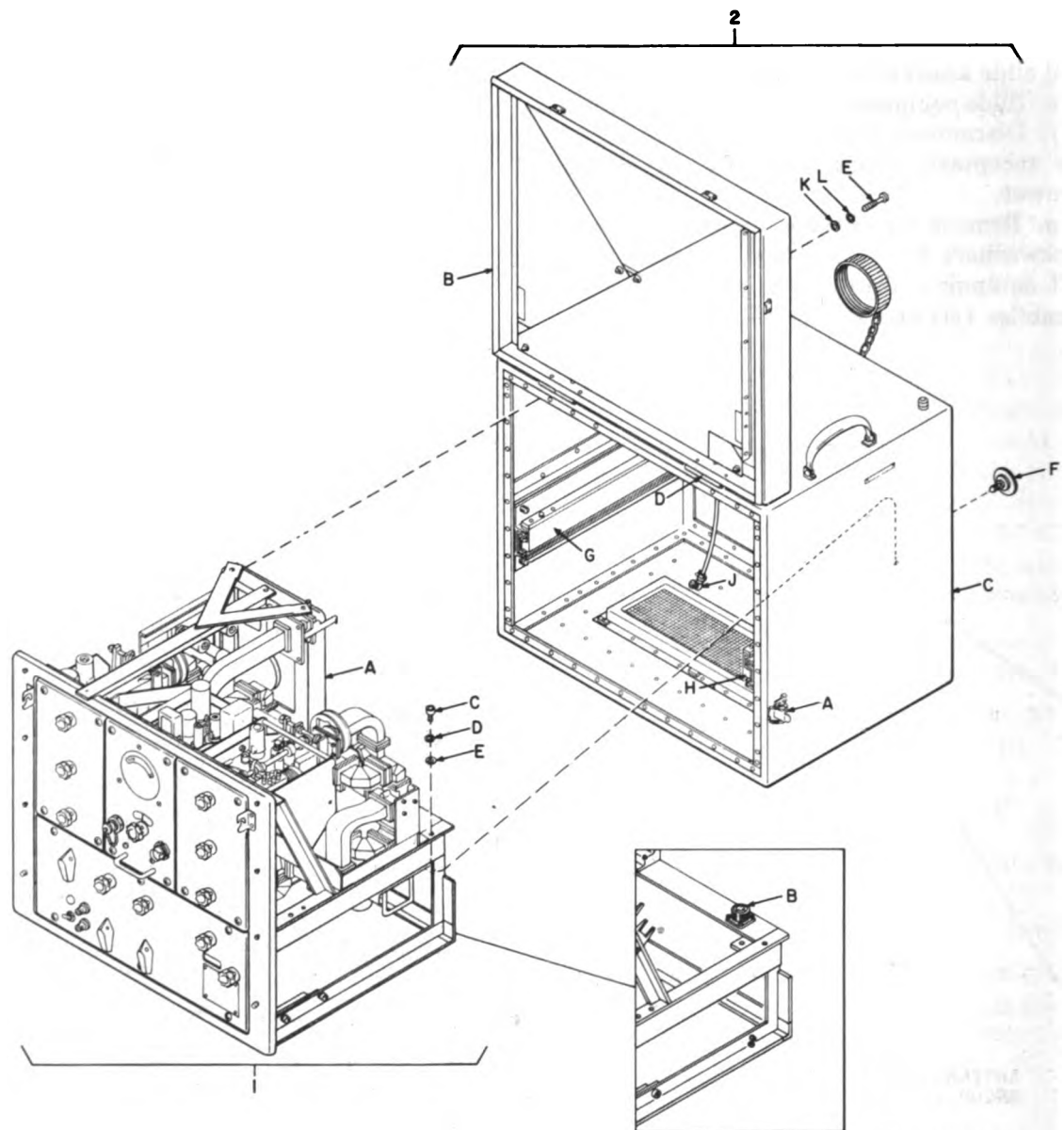
Figure 77. Radar test set group 10666808.

142. Removal of Missile Oscillator 8511656 (1, Fig. 79)

a. Turn waveguide clamp (2), which contains oscillator subassembly (3) to waveguide assembly (4), one-half turn counterclockwise until the parts are disengaged.

b. Disconnect connector (5) and receptacle connector (6) from their connectors in the missile oscillator (1).

c. Unscrew four externally-relieved body



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1—Equipment drawer 8024186 p/o radar test set 8024190, equipment drawer 9143814 p/o radar test set 9143816 or 10666805

- A — Bracket group (welded)
- B — Receptacle connector (J20)
- C — 1/4-20 X 1/2 hex-soc-hd screw (4)
- D — 1/4-in. lockwasher (4)
- E — 10/32-in. flat washer (4)

2—Radar test set cabinet 8024188 p/o radar test set 8024190, radar test set cabinet 9143813 p/o radar test set 9143816 or 10666805

- A — Snap fastener (4)
- B — Cover assembly

C — Cabinet

D — Hinge plate (2)

E — Externally-relieved body screw (4)

F — Bolt lock (2)

G — Left-hand rail slide assembly

H — Right-hand rail slide assembly

J — Receptacle connector (P20)

K — 3/16-in. flat washer (15)

L — No. 8 lock washer (15 p/o radar test set cabinet 8024188, No. 6 lock washer (15) p/o radar test set cabinet 9143813

Figure 78. Radar test set—partially exploded view.

screws (7), pull oscillator forward, and remove it from equipment drawer.

143. Removal of Target Oscillator 8511928 (14, Fig. 79) from Equipment Drawer 8024186 or Target Oscillator 9143818 or 10666800 from Equipment Drawer 9143814

a. Turn waveguide clamp (2) which connects oscillator subassembly (3) to waveguide assembly (15) one-half turn clockwise until the parts are disengaged.

b. Disconnect connector (16) and receptacle connector (18) from their connectors in the target oscillator.

c. Unscrew four externally-relieved body screws (7), pull oscillator forward, and remove from equipment drawer.

144. Removal of Test Set Monitor Indicator Panel (10185339 (8, Fig. 79)

a. Disconnect receptacle connector (9) from its connector (10).

b. Loosen two hexagon-socket setscrews (11) in plastic knob (12) and remove the knob from shaft (13).

c. Unscrew four externally-relieved body screws (7), pull indicator panel forward, and remove from equipment drawer.

145. Removal of Radar Test Set Pulse Generator 8517209 (17, Fig. 79) from Equipment Drawer 8024186 or Radar Test Set Pulse Generator 9143938 from Equipment Drawer 9143814

a. If target and missile oscillators (14 and 1) have not been removed, disconnect receptacle connectors (18 and 6) from their connectors in the target and missile oscillators.

b. Release two turnlock fastener studs (19) by turning one-quarter of a turn and lift generator from equipment drawer.

146. Removal of RF Power Meter 9986045 or 10665731 (1, Fig. 80)

a. Turn waveguide clamp (2) one-half turn counterclockwise and disconnect waveguide assembly (3) from power meter (1).

b. Unscrew six externally-relieved body screws (4) and pull unit slightly forward.

c. Disconnect connectors (5 and 6) from their receptacle connectors (7 and 8).

d. Pull unit forward and remove it from equipment drawer.

147. Removal of Radar Test Set Power Supply 8171354 (9, Fig. 80) from Equipment Drawer 8024186 or Radar Test Set Power Supply 9995749 from Equipment Drawer 9143814

a. Release four straight head pins (10) by turning them one-quarter of a turn.

b. Pull unit from equipment drawer.

148. Removal of Low-Power Servo Amplifier 7614253 (11, Fig. 80)

Notes. There are two low-power servo amplifiers in each of the radar test sets. One servo amplifier (20, fig. 79) is located adjacent to RF detector (21). The other servo amplifier (11, fig. 80) is located between the radar test set power supply (9) and RF power meter (1). The procedures below refer to figure 80. Both amplifiers are removed in the same manner.

a. Release two straight head pins (12) by turning one-quarter of a turn.

b. Pull amplifier from equipment drawer.

149. Removal of Radar Test Set Waveguide Assembly 9983719 (3, Fig. 80) from Equipment Drawer 8024186 or Test Set Subassembly 9989352 from Equipment Drawer 9143814

Notes. The missile and target oscillators (1 and 14, fig. 79) must be removed (para 142 and 143) before removal of the radar test set waveguide assembly or test set subassembly can be accomplished.

a. Remove three flat head screws (13, fig. 80) and one screw (14) with lockwasher (15)

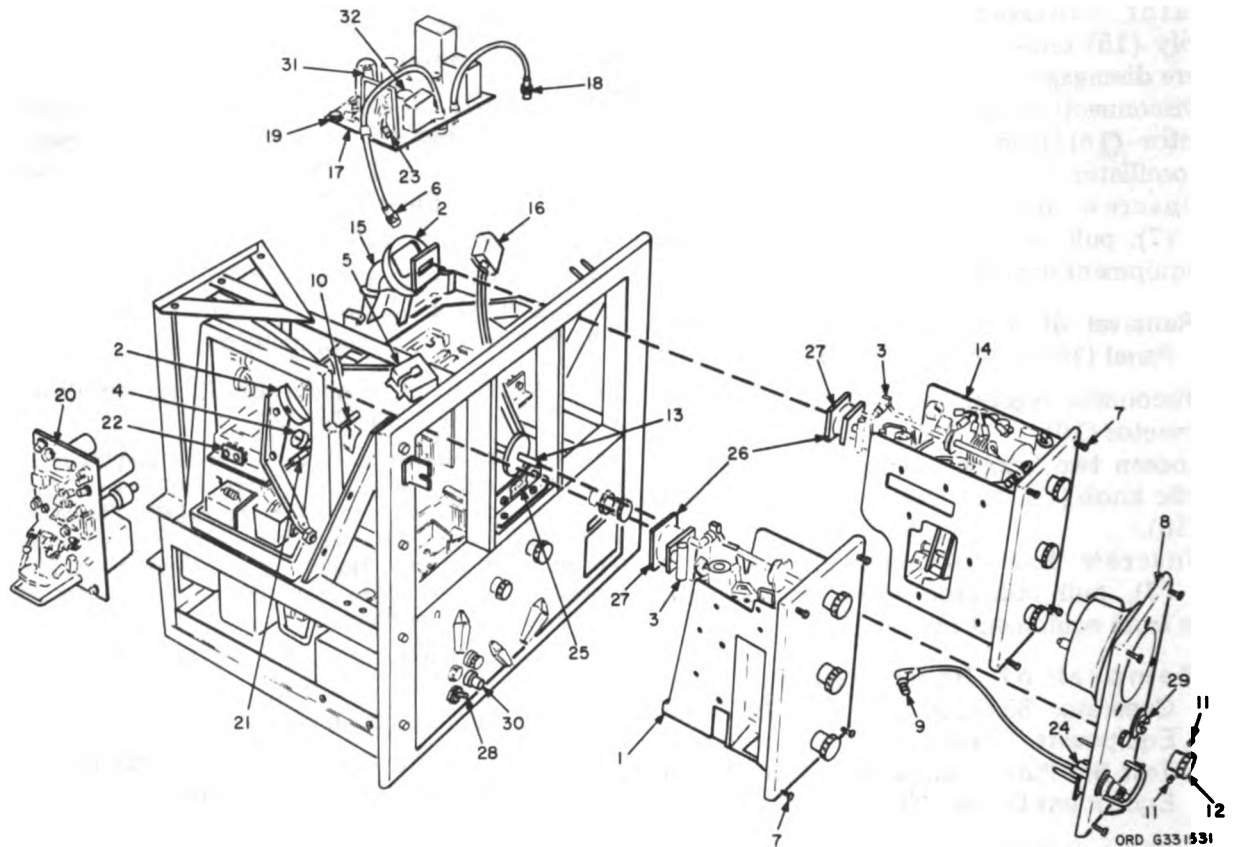


Figure 79. Equipment drawer—partially exploded view.

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|--|--|
| <ul style="list-style-type: none"> 1 — Missile oscillator 8511656 2 — Waveguide clamp (3) 3 — Oscillator subassembly 8024019, oscillator subassembly 9985676 p/o target oscillator 9148818 or 10666800 4 — Waveguide assembly 8170502 5 — Connector (P9) 6 — Receptacle connector (P12) 7 — No. 10-32 externally-relieved body screw (12) 8 — Test set monitor indicator panel 10185539 9 — Receptacle connector (P16) 10 — Connector (J16) 11 — No. 8-32 X 5/16 hex-soc setscrew (2) 12 — Plastic knob 13 — Shaft 14 — Target oscillator 8511928 p/o equipment drawer 8024186, target oscillator 9148818 or 10666800 p/o equipment drawer 9148814 15 — Waveguide assembly 8170500 p/o waveguide assembly 9983719, waveguide assembly 9156489 p/o test set subassembly 9989352 16 — Connector (P6) | <ul style="list-style-type: none"> 17 — Radar test set pulse generator 8517209 p/o equipment drawer 8024186, radar test set pulse generator 9143938 p/o equipment drawer 9143814 18 — Receptacle connector (P11) 19 — Turnlock fastener stud (2) 20 — Low-power servo amplifier 7614253 21 — RF detector 8020912 22 — Connector (J5) 23 — Receptacle connector (P8) 24 — Receptacle connector (P13) 25 — Connector (J13) 26 — Waveguide assembly 8021752 (2), not used on target oscillator 9148818 or 10666800 27 — Setscrew (4), not used on target oscillator 9148818 or 10666800 28 — Toggle switch 29 — Telephone jack U-79/U 30 — Fuseholder (2) 31 — Time relay 32 — Armature relay p/o radar test set pulse generator 8517209, electron tube 5670 p/o radar test set pulse generator 9143938 |
|--|--|

Figure 79. Equipment drawer—partially exploded view—legend.

and flat washers (16), and lift off angle bracket (17).

b. Remove three fillister-head machine screws (18) with lockwashers (19) which secure bracket group (20) to the equipment drawer.

c. Remove four screws (14) and lockwasher (15) and flat washers (16) which secure waveguide clamp assembly (21) and gasket (22) to marked panel (23).

d. Remove waveguide clamp assembly (21) with gasket (22) from marked panel (23) and remove bracket group (20) from equipment drawer.

e. Disconnect connector (24) from receptacle connector (25). If test set monitor indicator panel (8, fig. 79) has not been removed, disconnect receptacle connector (9) from connector (10) on the waveguide assembly. Loosen two hexagon-socket setscrews (11) on indicator panel and remove knob (12) from shaft (13).

f. Turn waveguide clamp (2, fig. 80) one-half turn counterclockwise and disconnect waveguide assembly from RF power meter (1).

g. Remove four screws (26) with lockwashers (27) and flat washers (28).

h. Lift rear of waveguide assembly approximately one inch and slide it from the equipment drawer. Exercise care to avoid striking components of waveguide assembly against equipment drawer.

150. Installation of Radar Test Set Waveguide Assembly 9983719 (3, Fig. 80) on Equipment Drawer 8024186 or Test Set Subassembly 9989352 (3) on Equipment Drawer 9143814

a. Place waveguide assembly on equipment drawer. Secure waveguide assembly to equipment drawer with four fillister-head screws (26) and lockwashers (27) and flat washers (28).

b. Insert connector (24) into receptacle connector (25).

c. Place bracket group (20) on equipment drawer, insert waveguide clamp assembly (21) with gasket (22) in position through marked panel (23), and secure the clamp assembly to the panel with four screws (14) with lockwashers (15) and flat washers (16).

d. Secure bracket group (20) to equipment drawer with three screws (18) and lockwashers (19).

e. Place bracket (17) over the bracket group and the equipment drawer and secure the bracket to the bracket group with three screws (13). Secure the bracket to the front of equipment rack with one screw (14) and lockwashers (15) and flat washers (16).

151. Installation of Low-Power Servo Amplifier 8614253 (11, Fig. 80)

Notes. There are two low-power servo amplifiers in each of the radar test sets. One servo amplifier (20,

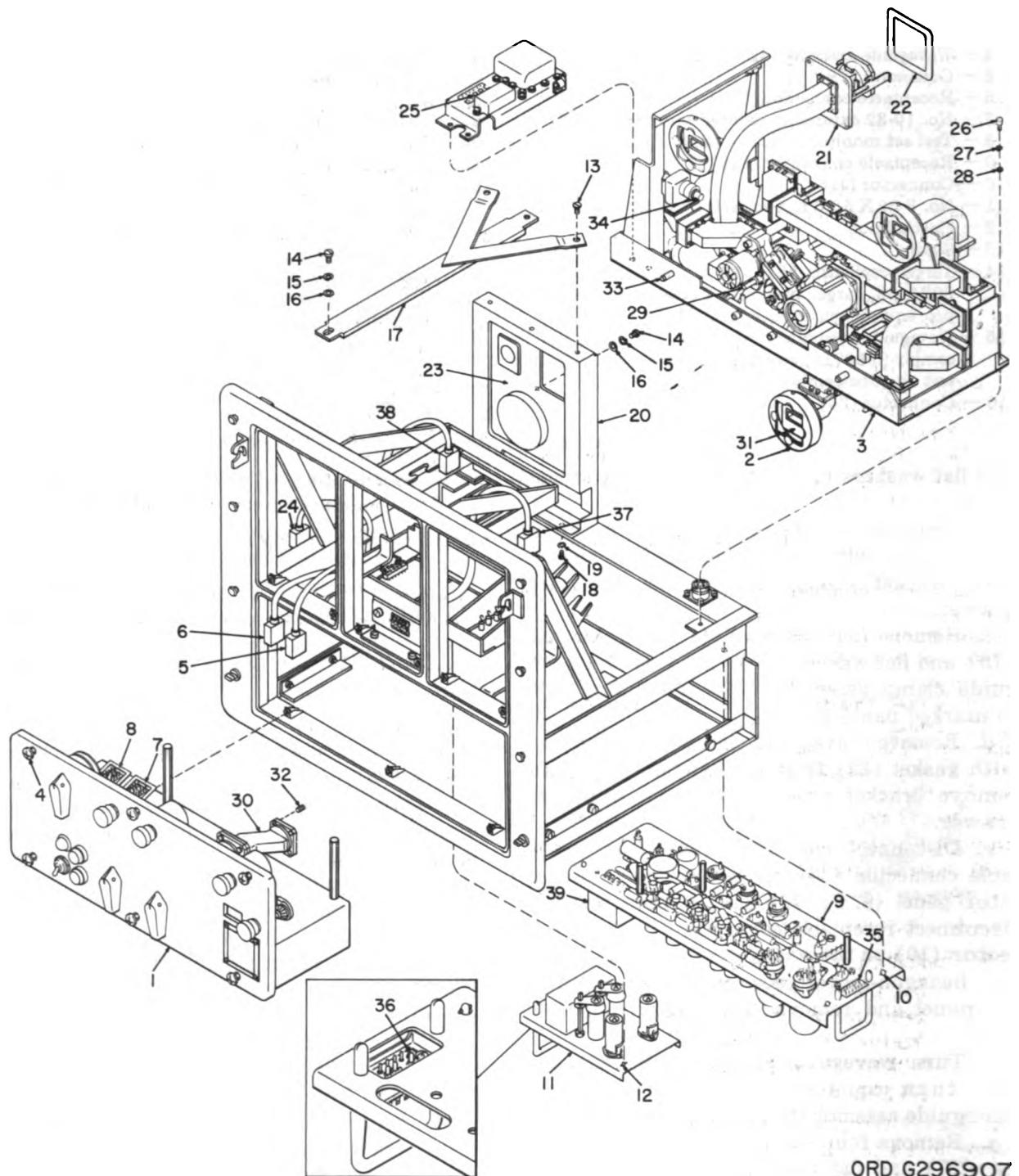


Figure 30. Equipment drawer—partially exploded view.

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 — RF power meter 9986045 or 10665731 2 — Waveguide clamp (3), only two waveguide clamps p/o test set subassembly 9989352 3 — Radar test set waveguide assembly 9983719 p/o equipment drawer 8024186, test set subassembly 9989352 p/o equipment drawer 9143814 4 — No. 10-32 externally-relieved body screw (6) 5 — Connector (P10) 6 — Connector (P3) 7 — Receptacle connector (J10) 8 — Receptacle connector (J3) 9 — Radar test set power supply 8171354 p/o equipment drawer 8024186, radar test set power supply 9995749 p/o equipment drawer 9143814 10 — Straight head pin (4) 11 — Low-power servo amplifier 7614253 12 — Turnlock fastener stud (2) 13 — No. 10-24 X 3/8 FH screw (3) 14 — No. 10-24 X 3/8 pan-hd screw (5) 15 — No. 10 lockwasher (5) 16 — No. 10 flat washer (5) 17 — Angle bracket 18 — No. 10-24 X 3/8 fil-h screw (3) p/o equipment drawer 8024186, No. 10-24 X 3/8 pan-hd screw (3) p/o equipment drawer 9143814 | <ul style="list-style-type: none"> 19 — No. 10 lockwasher (3) 20 — Bracket group 21 — Waveguide clamp assembly 8170671 22 — Gasket 23 — Marked panel 8024183 24 — Connector (P7) 25 — Receptacle connector (J7) 26 — 1/4-20 X 7/16 fil-h screw (4) p/o equipment drawer 8024186, 1/4-20 X 7/16 pan-hd screw (2) p/o equipment drawer 9143814 27 — 1/4 in. lockwasher (4), only two lockwashers p/o equipment drawer 9143814 28 — 0.05 od flat washer (4), only two flat washers p/o equipment drawer 9143814 29 — Headless straight pin 30 — Waveguide assembly 8517108 31 — Waveguide assembly 8024122 (2) 32 — No. 8-32 X 1/4 setscrew (2) 33 — Alinement pin (2) 34 — Connector (J16) 35 — Receptacle connector (P2) 36 — Receptacle connector (P1) 37 — Connector (P6) 38 — Connector (P9) 39 — Power step-up and step-down transformer |
|--|--|

Figure 80. Equipment drawer—partially exploded view—legend.

fig. 79) is located adjacent to RF detector (21). The other servo amplifier (11, fig. 80) is located between the power supply (9) and power meter (1). Both amplifiers are installed in the same manner. The receptacle connector (36, fig. 80) on each amplifier is marked P1. However, connector P1 on servo amplifier (20, fig. 79) connects with connector marked J5 (22) while connector (36, fig. 80) on servo amplifier (11) connects with connector marked J4 on equipment drawer. The procedures below refer to figure 80.

a. Insert receptacle connector (36) into its appropriate connector (see note above) and push servo amplifier into place.

b. Secure servo amplifier by engaging two turnlock fastener studs (12).

152. Installation of Radar Test Set Power Supply 8171354 (9, Fig. 80) on Equipment Drawer 8024186 or Radar Test Set Power Supply 9995749 on Equipment Drawer 9143814

a. Insert receptacle connector (35) into connector marked J2 on equipment drawer and push power supply into place.

b. Secure power supply by engaging four straight head pins (10).

153. Installation of RF Power Meter (1, Fig. 80)

a. Place RF power meter partially into

equipment drawer and connect connectors (5 and 6) with receptacle connectors (7 and 8).

b. Push RF power meter completely into place.

c. Aline the flanges on waveguide assembly (30) and waveguide assembly (31). Bring both parts together, inserting two setscrews (32) into guide holes in the waveguide assemblies. Place waveguide clamp (2) on the flange of waveguide assembly and turn the clamp one-half turn clockwise to secure the parts together.

d. Tighten six externally-relieved body screws (4).

154. Installation of Radar Test Set Pulse Generator 8517209 (17, Fig. 79) on Equipment Drawer 8024186 or Radar Test Set Pulse Generator 9143938 on Equipment Drawer 9143814

a. Insert receptacle connector (23) into connector marked J8 on the equipment drawer and push unit into place.

b. Secure pulse generator by engaging two turnlock fastener studs (19).

155. Installation of Test Set Monitor Indicator Panel 10185539 (8, Fig. 79)

- a. Insert shaft (13) through hole in test set monitor indicator panel.
- b. Insert receptacle connector (24) into connector (25) and push indicator panel into equipment drawer.
- c. Tighten four externally-relieved body screws (7).
- d. Place plastic knob (12) onto shaft (13) and tighten two hexagon-socket setscrews (11).
- e. Connect receptacle connector (9) with connector (10) on RF detector (21).

156. Installation of Target Oscillator 8511928 (14, Fig. 79) on Equipment Drawer 8024186 or Target Oscillator 9143818 or 10666800 on Equipment Drawer 9143814

- a. Push target oscillator into equipment drawer, inserting alinement pin (33, fig. 80) into rear of chassis.
- b. Aline flanges of waveguide assembly (26, fig. 79) and waveguide assembly (15). Bring both parts together, inserting two setscrews (27) into guide holes in the waveguide assembly. Place waveguide clamp (2) on the flange of waveguide assembly and turn the clamp one-half turn clockwise to secure parts together.
- c. Tighten four externally-relieved body screws (7).
- d. Insert connector (16) into receptacle connector marked J6 on the target oscillator. Connect receptacle (18) with connector marked J11 on the target oscillator.

157. Installation of Missile Oscillator 8511656 (1, Fig. 79)

- a. Push missile oscillator into equipment drawer, inserting alinement pin (33, fig. 80) into rear of chassis.

Section V. MAINTENANCE OF MISSILE OSCILLATOR 8511656

159. Removal and Test of Missile Oscillator

- a. Remove missile oscillator (1, fig. 79) from equipment drawer as instructed in paragraph 142.
- b. Refer to TM 9-1400-250-35/5/2 for test-

ing procedures.

- b. Tighten four externally-relieved body screws (7, fig. 79).
- c. Insert connector (5) into receptacle connector marked J9 on the missile oscillator. Connect receptacle connector (6) with connector marked J12 on missile oscillator.

d. Aline flanges of waveguide assembly (26) and waveguide assembly (4). Bring both parts together, inserting two setscrews (27) into guide holes in the waveguide assembly.

e. Place waveguide clamp (2) on the flange of the waveguide connector and turn clamp one-half turn clockwise to secure the parts together.

158. Installation of Equipment Drawer 8024186 (1, Fig. 78) into Radar Test Set Cabinet 8024188 (2) or Equipment Drawer 9143814 into Radar Test Set Cabinet 9143813

- a. Apply grease (3110-00-903-5526) sparingly to rail slide assemblies (2G and 2H). Place equipment drawer (1) on rail slide assemblies.
- b. Install four flat washers (1E), four lock-washers (1D), and four cap screws (1C), and secure equipment drawer (1) to rail slide assemblies (2G and 2H).
- c. Connect receptacle connector (2J) to receptacle connector (1B).
- d. Slide equipment drawer into radar test set cabinet on rail slide assemblies.
- e. Tighten two bolt locks (2F) to secure rail slide assemblies within the cabinet (2C).
- f. Tighten four externally-relieved body screws (2E) which secure bracket group (1A) to cabinet (2C).
- g. Insert shafts of cover assembly (2B) into hinge plates (2D) of cabinet and push cover assembly to the left.
- h. Set toggle switch (28, fig. 79) to OFF.
- i. Lower cover assembly (2B, fig. 78), and secure to the cabinet with four snap fasteners (2A).

ing procedures.

160. Removal and Installation of Marked Mounting Panel 8024031 (1, Fig. 81)

a. Removal.

- (1) Remove two hexagon-socket setscrews

(2) which secure each plastic knob (3) and knurled plastic knob (4) to their shafts. Remove the knobs from their shafts.

(2) Remove dust and moisture seal boot (5) which secures variable resistor (6) to the panel.

(3) Remove four cap screws (7) and four lockwashers (8) from the rear of frame (9). Pull marked mounting panel (1) from the frame.

b. Installation.

(1) Aline marked mounting panel (1) with shafts and variable resistor (6). Install dust and moisture seal boot (5) on the shaft of variable resistor (6).

(2) Secure the panel to frame (9) with four lockwashers (8) and four cap screws (7).

(3) Press two plastic knobs (3) and one knurled plastic knob (4) on their corresponding shafts and secure each knob with two setscrews (2).

161. Maintenance of Bracket and Gear Group 8023974

a. Removal.

(1) Remove marked mounting panel (1, fig. 81) as instructed in paragraph 160a.

(2) Remove one machine screw (11), hexagon nut (12), and lockwasher (13) which secure loop clamp (14) to the frame (9). Remove two machine screws (15), hexagon nuts (12), and lockwashers (13) which secure two more loop clamps (14) to the frame. Allow the three clamps, hanging free, to remain on the wiring harness.

(3) Remove two machine screws (11), hexagon nuts (12), and lockwashers (13) which secure marked bracket (16) to frame (9). Remove the bracket from the frame. Do not unsolder connections to components mounted on the bracket.

(4) Remove two machine screws (11), hexagon nuts (12), and lockwashers (13), which secure capacitor (17) to

the frame (9). Remove the capacitor. Do not unsolder the capacitor leads unless the capacitor is to be replaced.

(5) Remove three hexagon nuts (18) which secure three wire leads to oscillator subassembly (19). Identify the leads and the corresponding terminals. Remove the leads.

(6) Remove one machine screw (15) and lockwasher (13) which secure one lug terminal (20) to oscillator subassembly (19). Identify the lead and its installation point.

(7) Remove four screws (21), hexagon nuts (22), lockwashers (8), and flat washers (23) from each side of frame (9). Pull bracket and gear group (10), with oscillator subassembly attached, from the frame.

(8) Loosen two hexagon-socket setscrews (24) on rigid shaft coupling (25).

(9) Remove two screws (26), lockwashers (8), and flat washers (23) from slide plate (27). Pull slide plate, with oscillator subassembly (19) attached, from bracket and gear group (10).

(10) Remove two screws (15), and lockwashers (13) which secure slide plate (27) to oscillator subassembly (19). Remove the plate from the oscillator subassembly.

(11) Remove two screws (28), two lockwashers (29), and two flat washers (30) which secure guide plate (31) to frame (9). Remove the guide plate.

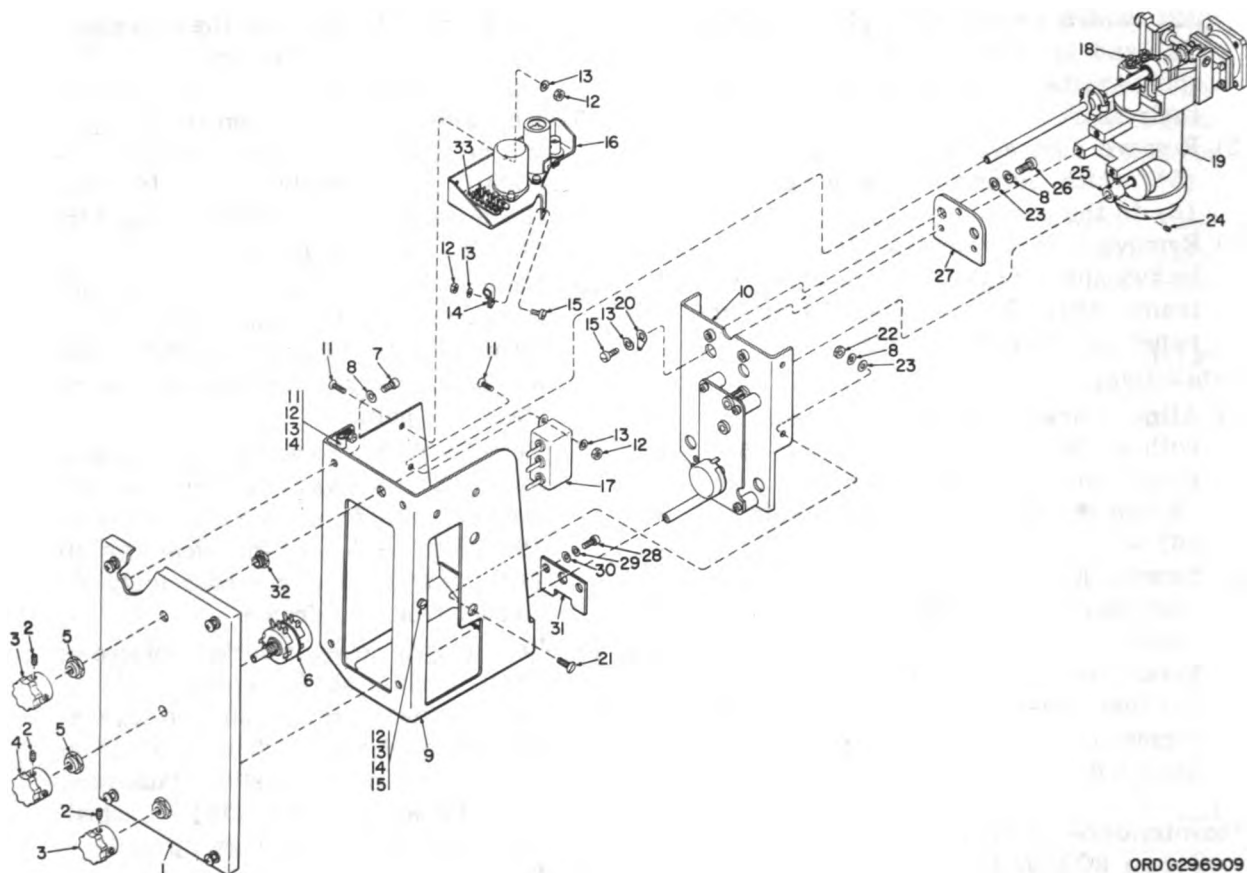
b. Disassembly.

(1) Remove two screws (1, fig. 82) and lockwashers (2) and remove two clamps (3) from variable resistor (4).

(2) Remove four screws (5), hexagon nuts (6), lockwashers (7), and flat washers (8) which secure plate (9) to bracket (10). Remove the plate and associated parts from the bracket.

(3) Remove four sleeve bushings (11), gearshaft (12), and spacers (13) from plate (9).

(4) Remove four screws (14) from shaft collar (15), and remove collar and spur gear (16) from the shaft of variable resistor (4).



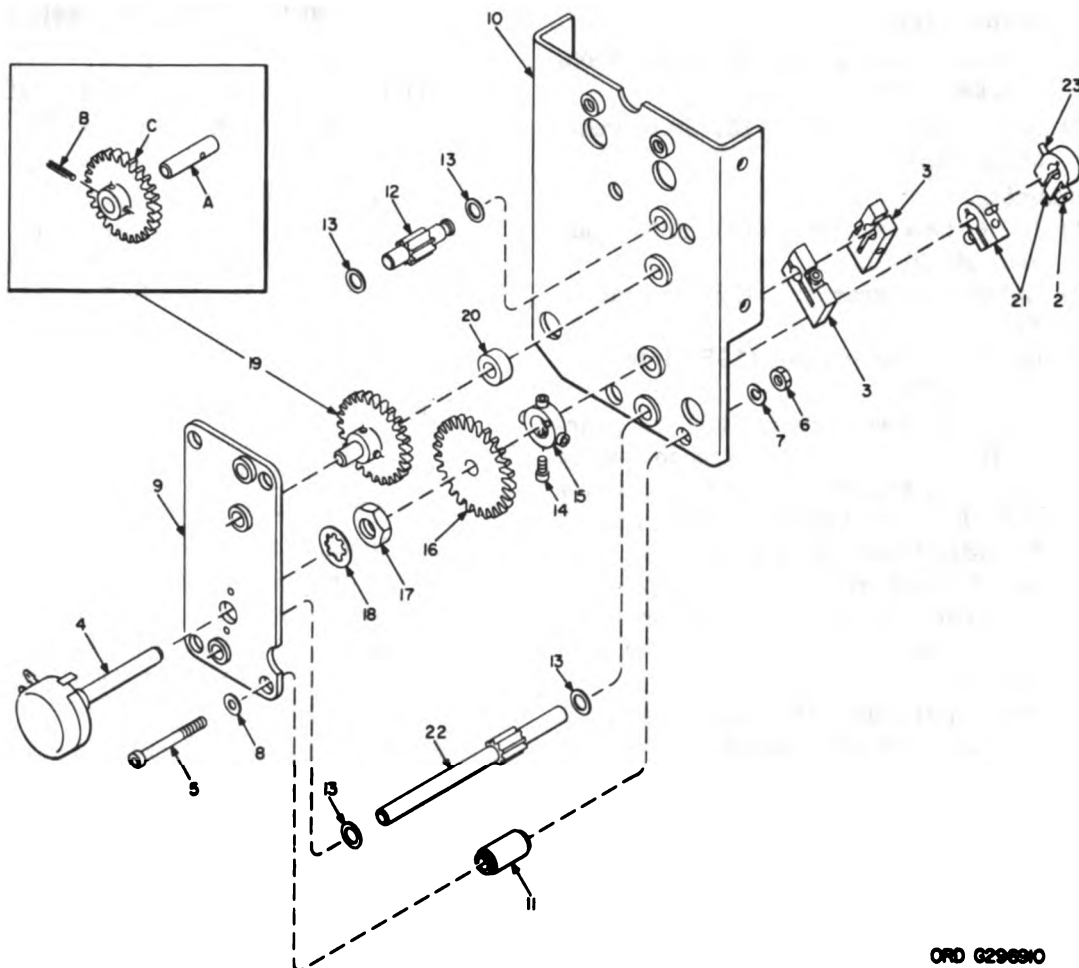
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- | | |
|--|--|
| 1 — Marked mounting panel 8024031 | 17 — Capacitor CP53B1EE105K |
| 2 — No. 8-32 x 5/16 hex-soc setscrew MS51963-36 (6) | 18 — No. 4-40 hex nut MS35649-242 (3) |
| 3 — Plastic knob 7599369 (2) | 19 — Oscillator subassembly 8024019 |
| 4 — Knurled plastic knob 7599438 | 20 — Lug terminal MS35431-8 |
| 5 — Dust and moisture seal boot 8175448 (3) | 21 — No. 10-24 x 7/16 FH machine screw MS35190-270 (4) |
| 6 — Variable resistor 8175578 | 22 — No. 10-24 hex nut MS35649-102 (4) |
| 7 — No. 10-24 x 3/8 hex-soc cap screw MS16997-43 (4) | 23 — No. 10 flat washer MS27183-8 (6) |
| 8 — No. 10 lockwasher MS35338-43 (10) | 24 — No. 6-32 x 3/16 hex-soc setscrew 8024507 (2) |
| 9 — Frame 8511655 | 25 — Rigid shaft coupling 8023969 |
| 10 — Bracket and gear group | 26 — No. 10-24 x 1/2 hex-soc cap screw MS16997-44 (2) |
| 11 — No. 6-32 x 3/8 FH machine screw 113423 (5) | 27 — Slide plate 8023973 |
| 12 — No. 6-32 hex nut MS35649-62 (7) | 28 — No. 8-32 x 3/8 hex-soc cap screw MS16997-31 (2) |
| 13 — No. 6 lockwasher MS35338-41 (10) | 29 — No. 8 lockwasher MS35338-42 (2) |
| 14 — Loop clamp NAS1397K3N (3) | 30 — 3/16-in. flat washer MS27183-7 (2) |
| 15 — No. 6-32 x 3/8 fil-h machine screw MS35265-28 (5) | 31 — Guide plate 8023964 |
| 16 — Marked bracket 8171352 | 32 — Bushing 8021259 (2) |
| | 33 — Connector (J12) 7598934 |

Figure 81. Missile oscillator—exploded view.

(5) Remove nut (17) and lockwasher (18) which secure variable resistor (4) to plate (9). Remove the resistor from the plate. Unsolder the wire leads from the resistor terminals. Identify the leads and the corresponding terminals.

(6) Remove spur gearshaft (19) and sleeve bushing (20) from plate (9).
 (7) Remove sleeve bushing (20) from shaft (19A).
 (8) Remove spring pin (19B) from spur gear (19C) and remove shaft (19A) from the gear.



ORD G29630

- 1 — No. 8-32 x 3/8 hex-soc cap screw MS16997-31 (4)
- 2 — No. 8 lockwasher MS35338-42 (4)
- 3 — Clamp 8023970 (2)
- 4 — Variable resistor 8176988
- 5 — No. 6-32 x 1-1/4 fil-h machine screw MS35265-35 (4)
- 6 — No. 6-32 hex nut MS35649-62 (4)
- 7 — No. 6 lockwasher MS35338-42 (4)
- 8 — 5/32-in. flat washer MS27183-6 (4)
- 9 — Plate 8023978
- 10 — Bracket 8023974
- 11 — Sleeve bushing 8023967 (4)
- 12 — Gearshaft 8023975
- 13 — Spacer 8017724 (4)

- 14 — No. 4-40 x 1/4 hex-soc cap screw MS16997-9 (4)
- 15 — Shaft collar 8023972
- 16 — Spur gear 8024070
- 17 — 3/8-32 hex nut MS25082-B7
- 18 — 3/8-in. lockwasher 7612520
- 19 — Spur gearshaft 8024017
 - A — Shaft 8023965
 - B — Spring pin MS16562-203
 - C — Spur gear 8023979
- 20 — Sleeve bushing 8023968
- 21 — Clamp 8023971
- 22 — Spur gearshaft 8023980
- 23 — Spring pin MS16562-209 (2)

Figure 82. Bracket and gear group—exploded view.

- (9) Remove two screws (1) and lockwashers (2) and remove two clamps (21) from gearshaft (22).
- (10) Remove spring pin (23) from each clamp (21).
- (11) Remove spur gearshaft (22) from bracket (10).
- (12) Remove two spacers (13) from gearshaft (22).

c. Assembly.

- (1) Place two spacers (13) onto spur gear shaft (22).
- (2) Install spur gearshaft (22) in bracket (10).
- (3) Install one spring pin (19B) into each clamp (21).
- (4) Place the two clamps (21) on gearshaft (22) and secure each clamp with lockwasher (2) and cap screw (1). Refer to TM 9-1400-250-35/5/2 for adjustment of clamps (21).
- (5) Insert shaft of variable resistor (4) into plate (9) and secure the resistor with lockwasher (18) and hexagon nut (17).
- (6) Place spur gear (16) on shaft of variable resistor (4). Place shaft collar (15) against spur gear and secure in position with four screws (14).
- (7) Place spur gear (19C) on shaft (19A) and secure in place with spring pin (19B).
- (8) Slide sleeve bushing (20) on shaft (19A).
- (9) Install spur gearshaft (19) on plate (9), meshing teeth of spur gear (19C) with teeth of spur gear (16).
- (10) Install gearshaft (12) with its two spacers (13) on plate (9), meshing teeth of gearshaft (12) with teeth of spur gear (19C).
- (11) Install four sleeve bushings (11) on plate (9).
- (12) Place plate (9) with its associated parts against bracket (10), meshing teeth of spur gearshaft (22) with teeth of spur gear (16).
- (13) Secure plate (9) to bracket (10) with four flat washers (8), four screws (5), four lockwashers (7), and four hexagon nuts (6).

- (14) Install two clamps (3) on the shaft of variable resistor (4) and secure each clamp in place with lockwasher (2) and cap screw (1). Refer to TM 9-1400-250-35/5/2 for adjustment of clamps.
- (15) Connect wire leads (b(5) above) to corresponding terminals of variable resistor (4).
- (16) Adjust reference position of variable resistor (4) and final position of clamps (3) and (21) during electrical test, as instructed in TM 9-1400-250-35/5/2.

d. Installation.

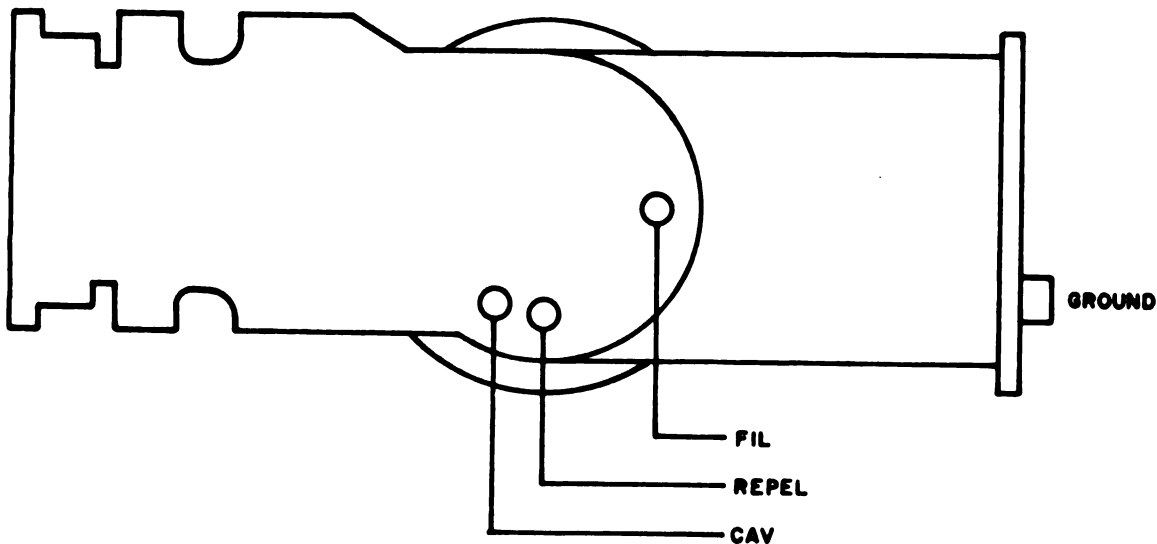
- (1) Install slide plate (27, fig. 81) on oscillator subassembly (19) and secure in position with two lockwashers (13) and two machine screws (15).
- (2) Install slide plate and connected oscillator subassembly (19) on bracket and gear group (10). Secure in place with two flat washers (23), two lockwashers (8), and two cap screws (26).
- (3) Tighten two setscrews (24) on rigid shaft coupling (25) to insure positive connection of the coupling with gearshaft (12, fig. 82).
- (4) Install bracket and gear group (10, fig. 81) with connected oscillator subassembly (19) on frame (9). Secure these components in place with four machine screws (21), four flat washers (23), four lockwashers (8), and four hexagon nuts (22).
- (5) Install one lug terminal (20) on oscillator subassembly (19) and secure in place with one lockwasher (13) and one machine screw (15).
- (6) Install three wire leads on proper terminals on oscillator subassembly (19) and secure them in place with three hexagon nuts (18). Refer to figure 83 for proper connections.
- (7) Install capacitor (17) on frame (9). Secure in place with two machine screws (11), two lockwashers (13), and two hexagon nuts (12).

(8) Install marked bracket (16) on frame (9). Secure in place with two machine screws, lockwashers, and hexagon nuts (11, 13, and 12).

(9) Secure three loop clamps (14) with machine screw, lockwasher, and hexagon nut (11, 13 and 12) for each loop clamp.

(10) Place guide plate (31) against frame (9), and secure with two flat washers, lockwashers, and capscrews (30, 29 and 28).

(11) Install marked mounting panel (1) as instructed in paragraph 160 b



RA PD 255839

Figure 83. Oscillator subassembly—wiring diagram.

162. Maintenance of Oscillator Subassembly 8024019

a. Removal.

(1) Remove marked mounting panel (1, fig. 81) as instructed in paragraph 160 a

(2) Remove oscillator subassembly (19) as instructed in paragraph 161 a (5) through (10).

Note. The procedures outlined in b and c below also apply to oscillator subassembly 9985676.

b. Disassembly.

(1) Unscrew electrical cap (1, fig. 84), and remove from oscillator tube mounting (2).

(2) Reach inside the oscillator tube mounting, and loosen one setscrew (3A) which

secures tuning shaft (3B) to the tuning bow screw (4) on electron tube (5).

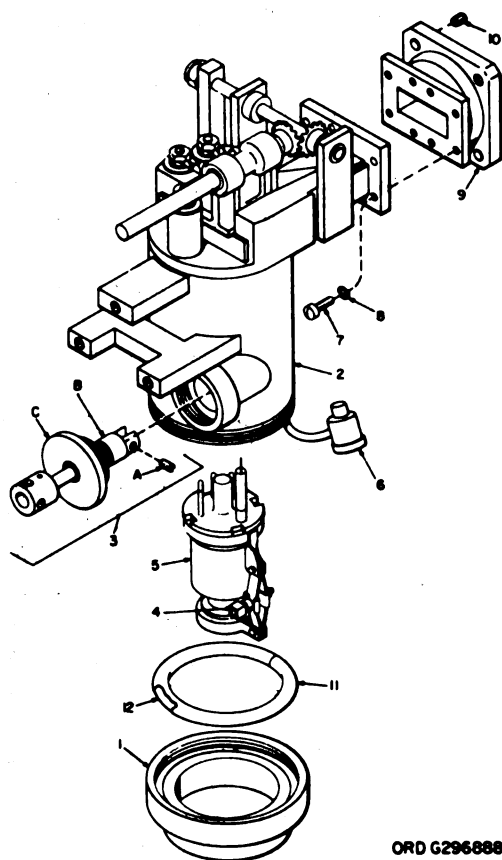
(3) Unscrew nut (3C), and remove shaft assembly (3) from the oscillator tube mounting (2).

(4) Remove repeller plate cap (6) from electron tube (5), and pull out the tube.

(5) Remove eight machine screws (7) and lockwashers (8), and remove waveguide assembly (9).

(6) Remove two setscrews (10) from the flange of waveguide assembly (9).

(7) Remove flexible conduit (11) and insulation sleeving (12) from its groove in the cap only if they are to be replaced.



1. Electrical cap
2. Oscillator tube mounting
3. Shaft assembly
 - A—No. 4-40 x $\frac{1}{8}$ hex-soc setscrew
 - B—Tuning shaft
 - C—Nut
4. Tuning bow screw.
5. Electron tube
6. Repeller plate cap
7. No. 4-40 x $\frac{3}{8}$ fil-h machine screw (8)
8. No. 4 lockwasher (8)
9. Waveguide assembly
10. No. 8-32 setscrew
11. Flexible metal conduit
12. Electrical insulation sleeving

Figure 84. Oscillator subassembly—exploded view.

c. Assembly.

(1) Install waveguide assembly (9) on oscillator tube mounting (2), and secure in place with eight lockwashers and machine nuts (8 and 7). Install two setscrews (10) into the flange of waveguide assembly (9).

(2) Install electron tube (5) in oscillator tube mounting. Make sure that electron tube probe and key positions are aligned with tube socket and probe hole. Install repeller plate cap (6) on the tube.

(3) Aline slot on tuning shaft (3B) with tuning bow screw (4) on the electron tube. Screw nut (3C) fingertight as far as it will go; then back off the nut one-quarter of a turn.

(4) Reach inside the oscillator tube mounting, and tighten the setscrew (3A) on the tuning shaft to secure shaft assembly (3) to the electron tube.

(5) Insert a piece of insulating sleeving (12), cut to a length of $7 \frac{1}{32}$ inches, inside $\frac{1}{4}$ od x $6 \frac{21}{32}$ inches long flexible conduit (11). When forming these parts, pull insulating material out approximately three-eighths of an inch, and insert it into the other end of the flexible conduit. Draw the ends of the conduit together as closely as possible. Insert the formed conduit and insulating sleeving in its groove in electrical cap (1).

(6) Install the cap on the tube mounting; tighten finger-tight.

d. Installation.

(1) Install oscillator subassembly as instructed in paragraph 161 d

(2) Install marked mounting panel as instructed in paragraph 160 b

163. Installation of Missile Oscillator

Install missile oscillator in electrical equipment drawer as instructed in paragraph 157.

Section VI. MAINTENANCE OF TARGET OSCILLATOR

164. Removal of Target Oscillator

Remove target oscillator (14, fig. 79) from the

equipment drawer as instructed in paragraph 143.

165. Removal and Installation of Marked Mounting Panel (1, Fig. 85)

a. Removal.

- (1) Remove two setscrews (2), which secure each plastic knob (3) and knurled plastic knob (4) to their shafts. Remove the knobs.
- (2) Remove dust and moisture seal boot (5) which secures variable resistor (6) to the panel.
- (3) Remove four cap screws (7) and four lockwashers (8) from rear of target oscillator housing (9). Pull the panel from the housing.

b. Installation.

- (1) Aline marked mounting panel (1) with shafts and variable resistor (6). Secure the panel to target oscillator housing (9) with four cap screws (7) and lockwashers (8).
- (2) Install dust and moisture seal boot (5) on the shaft of variable resistor (6).
- (3) Press two plastic knobs (3) and one knurled plastic knob (4) on their corresponding shafts. Secure each knob with two setscrews (2).

166. Maintenance of Electro-Mechanical Rotary Actuator 8024085

a. Removal.

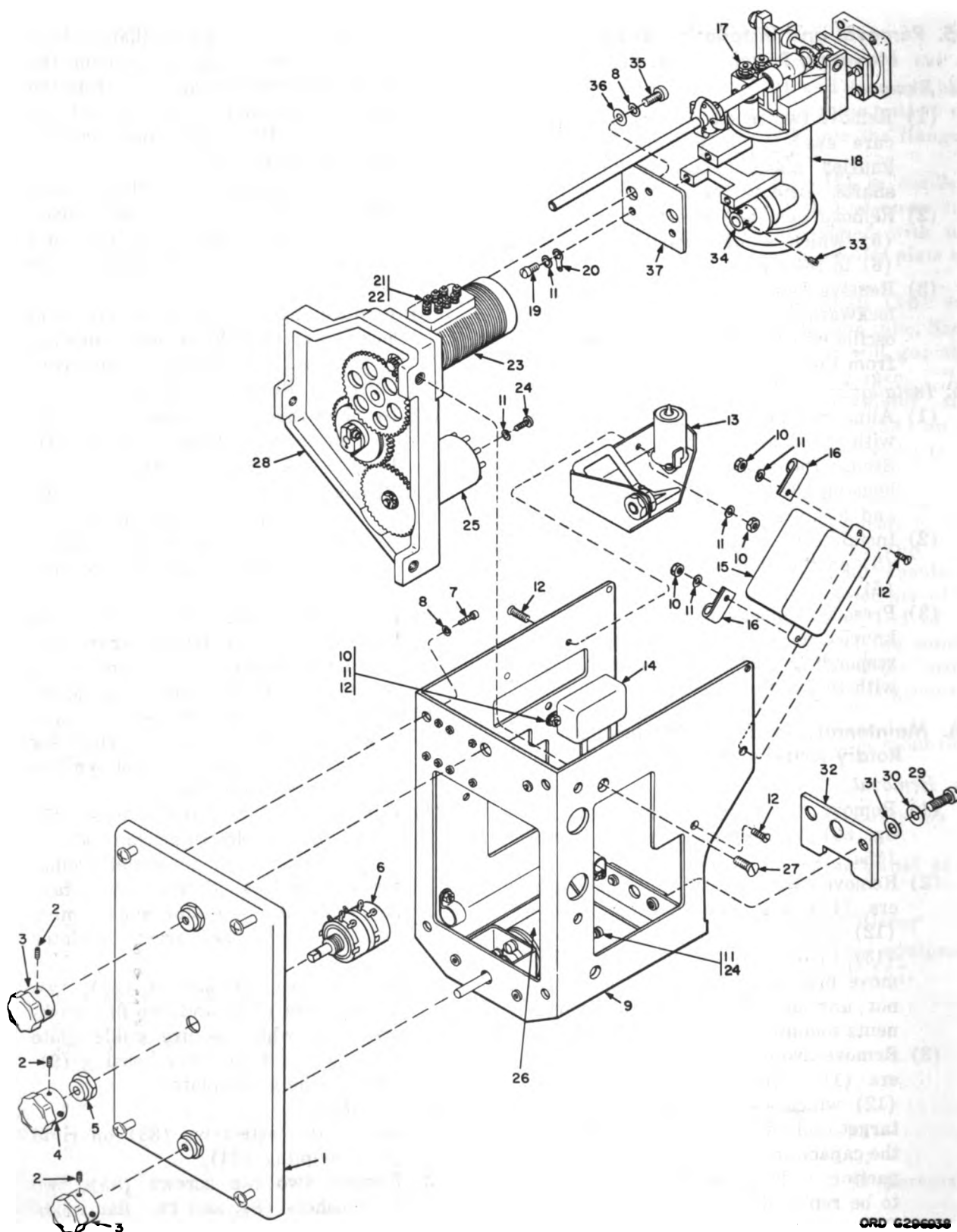
- (1) Remove marked mounting panel (1, fig. 85) as instructed in paragraph 165a.
- (2) Remove two nuts (10), two lockwashers (11), and two machine screws (12) which secure marked bracket (13) to oscillator housing (9). Remove bracket from the housing. Do not unsolder connections to components mounted on the bracket.
- (3) Remove two nuts (10), two lockwashers (11), and two machine screws (12) which secure capacitor (14) to target oscillator housing (9). Remove the capacitor. Do not unsolder the capacitor leads unless the capacitor is to be replaced.
- (4) Remove two nuts (10), two lockwashers (11), and two machine screws (12) which secure capacitor (15) and

clamp (16) to target oscillator housing (9). Remove the clamp from the cable. Remove the capacitor from the target oscillator housing. Do not unsolder capacitor leads unless capacitor is to be replaced.

- (5) Remove three nuts (17) which secure three wire leads to oscillator subassembly (18). Identify the leads and corresponding terminals. Remove the leads.
- (6) Remove one machine screw (19) and lockwasher (11) which secure one lug terminal (20) to oscillator subassembly (18). Remove the lead.
- (7) Unsolder three wire leads from terminals on variable resistor (1, fig. 87). Identify the leads and terminals.
- (8) Remove eight machine screws (21, fig. 85) and eight lockwashers (22) which secure eight marked wire leads to motor-generator (23). Remove the leads.
- (9) Remove five machine screws (24) and lockwashers (11) which secure five marked wire leads to synchro control transformer (25). Remove the leads.
- (10) Remove six machine screws (24) and lockwashers (11) which secure six marked wire leads to control synchro (26). Remove the leads.
- (11) Remove three machine screws (27) which secure electro-mechanical rotary actuator (28) to target oscillator housing (9). Remove the rotary actuator with oscillator subassembly attached from the target oscillator housing.
- (12) Remove two cap screws (29), two lockwashers (30), and two flat washers (31) which secure guide plate (32) to target oscillator housing (9). Remove the guide plate.

b. Disassembly.

- (1) Loosen two setscrews (33) on rigid shaft coupling (34).
- (2) Remove two cap screws (35), two lockwashers (8), and two flat washers (36) which secure oscillator subassembly (18) and slide plate (37) to the electro-mechanical rotary actuator



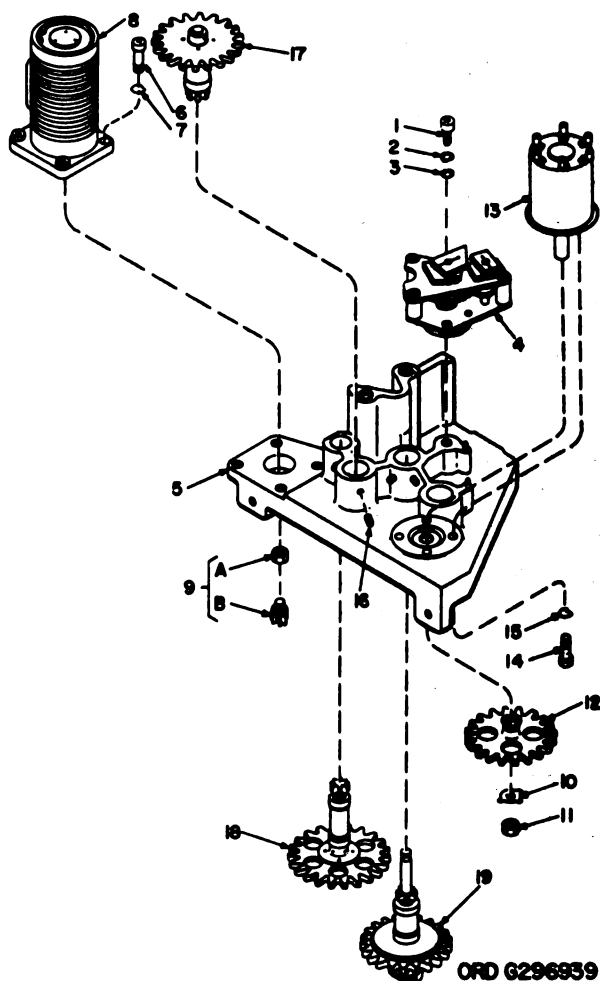
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Figure 85. Target oscillator—exploded view.

- | | |
|--|---|
| <p>1—Marked mounting panel 8016761
 2—No. 8-32 x 5/16 hex-soc setscrew MS51963-36 (6)
 3—Plastic knob 7599369 (2)
 4—Knurled plastic knob 7599438
 5—Dust and moisture seal boot 8175448 (3)
 6—Variable resistor 8175578
 7—No. 10-24 x 3/8 hex-soc cap screw MS16997-43 (4)
 8—No. 10 lockwasher MS35338-43 (6)
 9—Target oscillator housing 8512012 p/o target oscillator 8511928, target oscillator housing 9143954 p/o target oscillator 9143818
 10—No. 6-32 hex nut MS35649-62 (6)
 11—No. 6 lockwasher MS35338-41 (18)
 12—No. 6-32 x 3/8 FH machine screw MS35190-236 (6)
 13—Marked bracket 8512010 p/o target oscillator 8511928, marked bracket 9143821 p/o target oscillator 9143818
 14—250,000 mmf fixed capacitor CP35B1EF254K
 15—1 mf fixed capacitor CP53B1EE105K
 16—Loop clamp MS25281-4 (2) (Only one clamp p/o target oscillator 9143818)
 17—No. 4-40 hex nut 425916 (6)</p> | <p>18—Oscillator subassembly 8024019 p/o target oscillator 8511928, oscillator subassembly 9985676 p/o target oscillator 9143818
 19—No. 6-32 x 3/8 fil-h machine screw MS35206-228 (3)
 20—Lug terminal MS35431-8
 21—No. 4-40 x 1/4 fil-h machine screw 131825 (8)
 22—No. 4 lockwasher 131825 (8)
 23—Motor-generator 7605334
 24—No. 6-40 x 1/4 fil-h machine screw 225116 (11)
 25—Synchro control transformer 8176995
 26—Control synchro 8176994
 27—No. 10-24 x 7/16 FH machine screw MS35190-270 (3)
 28—Electro-mechanical rotary actuator 8024085
 29—No. 8-32 x 1/2 hex-soc cap screw MS16997-32 (2)
 30—No. 8 lockwasher MS35338-42 (2)
 31—3/16-in-id flat washer MS27183-7 (2)
 32—Guide plate 8023964
 33—No. 6-32 x 3/16 hex-soc setscrew 8024507 (2)
 34—Rigid shaft coupling 8023969
 35—No. 10-24 x 1/2 hex-soc cap screw MS16997-44 (2)
 36—No. 10 flat washer MS27183-9 (2)
 37—Slide plate 8016766</p> |
|--|---|

Figure 85. Target oscillator—exploded view—legend.

- (28). Remove the subassembly with slide plate attached from the actuator.
- (3) Remove two cap screws (1, fig. 86), two lockwashers (2), and two flat washers (3) which secure R5 gear group (4) to gear housing (5).
- (4) Remove four cap screws (6) and four lockwashers (7) which secure motor-generator (8) to the gear housing (5). Remove the motor-generator.
- Note.* Gear (9B) is a fiber gear and is easily damaged. Remove it only if it is worn and has to be replaced.
- (5) Loosen lock nut (9A) on gear (9B) and remove spur gear subassembly (9) from shaft.
- (6) Straighten tangs on driver washer (10) and remove hexagon nut (11). Pull spur gear (12) from shaft of synchro control transformer (13).
- (7) Remove four cap screws (14) and four lockwashers (15) and pull synchro control transformer (13) from gear housing (5).
- (8) Remove two setscrews (16) which secure bearing assembly (17). Remove bearing assembly from the gear housing (5).
- (9) Remove two setscrews (16) which secure gear assembly (18) to the gear housing (5). Remove the gear assembly.
- (10) Remove two setscrews (16) which secure friction clutch (19) to the gear housing (5). Remove the friction clutch.
- (11) Disassemble R5 gear group as indicated in (a) through (e) below.
- (a) Remove one cap screw (2, fig. 87) from each of two stop actuators (3 and 4). Remove the actuators from the shaft of variable resistor (1).
- (b) Remove one cap screw (2) from each of remaining two stop actuators (5 and 6). Remove the actuators from the spur gearshaft (7).
- (c) Remove three nuts (8), three lockwashers (9), six flat washers (10), and three machine screws (11). Pull bearing assembly (12), spur gearshaft (7), and three sleeve bushings (13) from bearing assembly (14).
- (d) Remove four cap screws (15) and slide shaft collar (16) and spur gear (17) from shaft of variable resistor (1).
- (e) Remove hexagon nut (18) and lockwasher (19) and remove variable resistor (1) from bearing assembly (14).

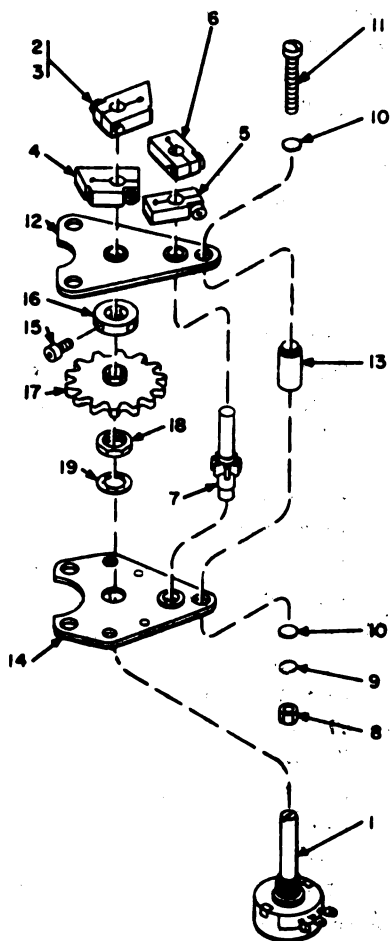


- 1 — No. 10-24 x 1/2 hex-soc cap screw MS16997-44 (2)
- 2 — No. 10 lockwasher MS35338-43 (2)
- 3 — No. 10 flat washer MS27183-8 (2)
- 4 — R5 gear group
- 5 — Gear housing 8512011
- 6 — No. 8-32 x 5/8 hex-soc cap screw MS16997-33 (4)
- 7 — No. 8 lockwasher MS35338-42 (4)
- 8 — Motor-generator 7605334
- 9 — Spur gear subassembly 8024069
 - A — Lock nut 7604253
 - B — Gear 8024068
- 10 — Drive washer Bu Ord 643090
- 11 — No. 10-32 hex nut Bu Ord 644594
- 12 — Spur gear 8024042
- 13 — Synchro control transformer MIL-S-20706-15
- 14 — No. 4-40 x 1/4 hex-soc cap screw MS16997-9 (4)
- 15 — No. 4 lockwasher MS35338-40 (4)
- 16 — No. 6-32 x 3/16 setscrew MS51963-21 (6)
- 17 — Bearing assembly 8511814
- 18 — Gear assembly 8024053
- 19 — Friction clutch 8511802

Figure 86. Electro-mechanical rotary actuator—
exploded view.

c. Assembly.

- (1) Assemble R5 gear group as indicated in (a) through (e) below.
 - (a) Install variable resistor (1) on bearing assembly (14) and secure with one lockwasher (19) and one hexagon nut (18).
 - (b) Place spur gear (17) and shaft collar (16) on shaft of variable resistor (1). Secure the collar in place with four cap screws (15).
 - (c) Install spur gearshaft (7), three sleeve bushings (13), three flat washers (10), and three machine screws (11) on bearing assembly (12). Align these parts with bearing assembly (14). Secure the two bearing assemblies and related parts together with three flat washers (10), three lockwashers (9), and three hexagon nuts (8).
 - (d) Install two stop actuators (5 and 6) on spur gearshaft (7) and secure them with two cap screws (2).
 - (e) Install two stop actuators (3 and 4) on shaft of variable resistor (1) and secure with two cap screws (2). Set the four stop actuators to final position during electrical test as instructed in TM 9-1400-250-35/5/2.
- (2) Install friction clutch (19, fig. 86) in gear housing (5) and secure in place with two setscrews (16).
- (3) Install gear assembly (18) in gear housing (5) and secure in place with two setscrews (16).
- (4) Install bearing assembly (17) in gear housing (5) and secure in place with two setscrews (16).
- (5) Install synchro control transformer (13) in gear housing (5) and secure in place with four lockwashers (15) and four cap screws (14).
- (6) Install spur gear (12) on shaft of synchro control transformer (13) so that the gear shoulder faces the transformer. Secure the gear with drive washer (10) and hexagon nut (11). Bend the tangs on drive washer to lock the nut in position.
- (7) Slide lock nut (9A) on shaft of motor-



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- 1 — Variable resistor 8176988
- 2 — No. 8-32 x 3/8 hex-soc cap screw MS16997-31 (4)
- 3 — Stop actuator 8511893
- 4 — Stop actuator 8511892
- 5 — Stop actuator 8511891
- 6 — Stop actuator 8511890
- 7 — Spur gearshaft 8024076
- 8 — No. 6-32 hex nut MS35649-62 (3)
- 9 — No. 6 lockwasher MS35338-41 (3)
- 10 — 5/32-in-id flat washer MS27183-6 (6)
- 11 — No. 6-32 x 1-1/4 fil-h machine screw MS35265-35 (3)
- 12 — Bearing assembly 8024086
- 13 — Sleeve bushing 8023967 (3)
- 14 — Bearing assembly 8024087
- 15 — No. 4-40 x 1/4 hex-soc cap screw MS16997-9 (4)
- 16 — Shaft collar 8023972
- 17 — Spur gear 8024070
- 18 — 3/8-32 hex nut MS25082B7
- 19 — 3/8-in-id int-teeth lockwasher 7612520

Figure 87. R5 gear group—exploded view.

generator (8). Install gear (9B) on the shaft and secure the gear in place by tightening the lock nut.

Note. Gear (9B) is a fiber gear and is easily damaged. Exercise care to prevent damage.

- (8) Install motor-generator (8) on gear housing (5). Secure in place with four lockwashers (7) and four cap screws (6).
- (9) Install R5 gear group (4) on gear housing (5). Secure in place with two flat washers (3), two lockwashers (2), and two cap screws (1).
- (10) Install oscillator subassembly (18, fig. 85) and attached slide plate (37) on electro-mechanical rotary actuator (28). Secure in place with two flat washers (36), two lockwashers (8), and two cap screws (35).
- (11) Tighten two setscrews (33) on rigid shaft coupling (34). Apply a light coat of aircraft and instrument grease MIL-G-23827A to all gear teeth.

d. Installation.

- (1) Install electro-mechanical rotary actuator (28, fig. 85) with connected oscillator subassembly (18) in target oscillator housing (9). Secure in place with three machine screws (27).
- (2) Install three wire leads on variable resistor (6). Solder the leads. Refer to figure 88 for proper connections.

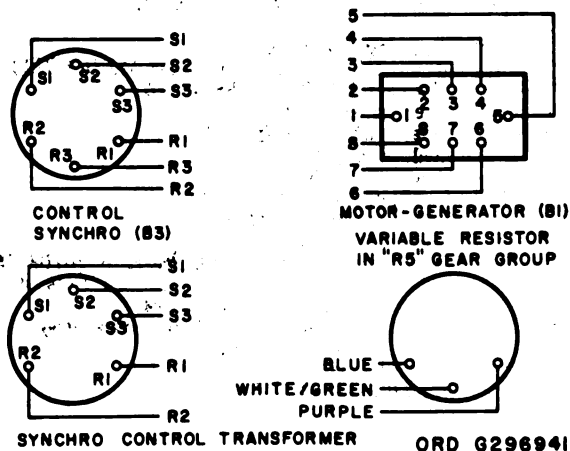


Figure 88. Target oscillator—wiring diagram.

- (3) Position guide plate (32, fig. 85) against target oscillator housing (9) and secure with two flat washers (31), two lockwashers (30), and two cap screws (29).
- (4) Install six marked wire leads on corresponding marked terminals of control synchro (26). Secure in place with six lockwashers (11) and machine screws (24). Refer to figure 88 for proper connections.
- (5) Install five marked wire leads on corresponding marked terminals of synchro control transformer (25, fig. 85). Secure in place with five lockwashers (11) and machine screws (24). Refer to figure 88 for proper connections.
- (6) Install eight marked wire leads on corresponding marked terminals of motor-generator (23, fig. 85). Secure in place with eight lockwashers (22) and machine screws (21). Refer to figure 88 for proper connections.
- (7) Install one lug terminal (20, fig. 85) on oscillator subassembly and secure in place with one lockwasher (11) and one machine screw (19).
- (8) Install three marked wire leads on terminals of oscillator subassembly (18) and secure with three hexagon nuts (17). Refer to figure 83 for proper connections.
- (9) Install capacitor (15) and clamps (16) on target oscillator housing (9). Secure in place with two machine screws (12), two lockwashers (11), and two hexagon nuts (10).
- (10) Install capacitor (14) on target oscillator housing (9) and secure in place with two machine screws (12), two lockwashers (11), and two hexagon nuts (10).
- (11) Install marked bracket (13) on target oscillator housing (9). Secure in place with two machine screws (12), two lockwashers (11), and two hexagon nuts (10).
- (12) Install marked mounting panel (1) as instructed in paragraph 165b.

167. Maintenance of Oscillator Subassemblies 8024019 and 9985676

a. Removal.

- (1) Remove marked mounting panel (1, fig. 85) as instructed in paragraph 165a.
- (2) Remove marked bracket (13) as instructed in paragraph 166a(2).
- (3) Remove oscillator subassembly (18) from electro-mechanical rotary actuator (28) as instructed in paragraphs 166a(5) and (6), and b(1) and (2).
- (4) Remove two machine screws (19) and two lockwashers (11) which secure slide plate (37) to oscillator subassembly (18). Remove slide plate from oscillator subassembly.

b. *Disassembly.* Disassemble oscillator subassembly as instructed in paragraph 162b.

c. *Assembly.* Assemble oscillator subassembly as instructed in paragraph 162c.

d. Installation.

- (1) Install slide plate (37, fig. 85) on oscillator subassembly (18) and secure in place with two lockwashers (11) and two machine screws (19).
- (2) Aline slide plate, attached to oscillator subassembly, and rigid shaft coupling (34) with electro-mechanical rotary actuator (28). Secure the parts with two flat washers (36), two lockwashers (8), and two cap screws (35).
- (3) Tighten two setscrews (33) on rigid shaft coupling (34).
- (4) Install lug terminal (20) on oscillator subassembly (18) and secure in place with lockwasher (11) and machine screw (19).
- (5) Install three marked wire leads on proper terminals of oscillator subassembly (18) and secure in place with three hexagon nuts (17). Refer to figure 83 for proper connections.
- (6) Install marked bracket (13) on target oscillator housing (9) and secure in place with two machine screws (12), two lockwashers (11), and two hexagon nuts (10).
- (7) Install marked mounting panel (1) as instructed in paragraph 165b.

168. Synchro Transmitter Subassembly

a. Removal.

(1) Remove two setscrews (1, fig. 89) which secure plastic knob (2) to its shaft. Remove the knob.

(2) Remove five machine screws (3A) and five lockwashers (3B), and disconnect marked wire leads from transmitter synchro (3C).

(3) Remove two machine screws, lockwashers, and flat washers (5, 6, and 7) and remove synchro transmitter subassembly (3) from target oscillator housing (4).

b. Disassembly.

(1) Loosen machine screw (3D).

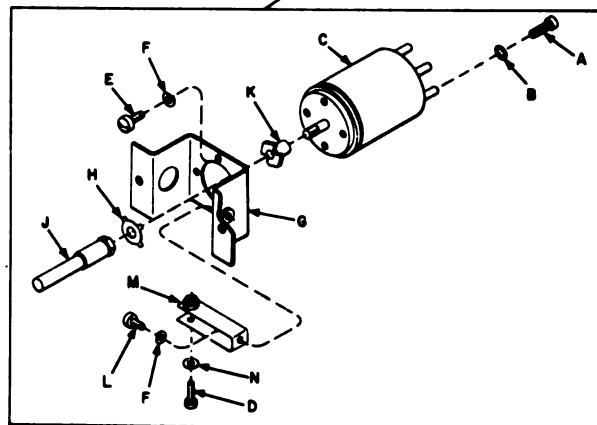
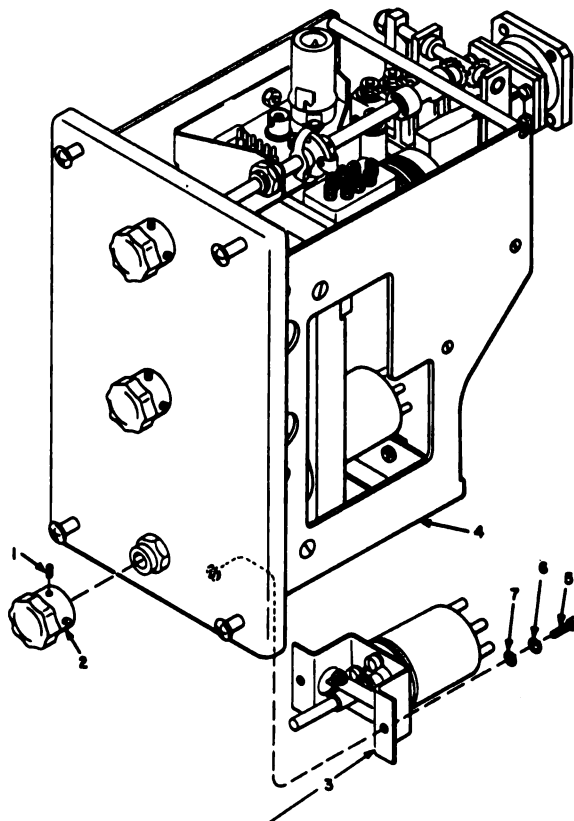
(2) Remove four machine screws and lockwashers (3E and 3F). Remove transmitter synchro (3C) and attached parts from the bracket (3G).

(3) Straighten tangs on drive washer (3H), and remove coupling shaft (3J), drive washer (3H), and sleeve bearing (3K) from shaft of transmitter synchro (3C).

(4) Remove one fillister-head machine screw (3L) and lockwasher (3F) from angle bracket (3M). Remove angle bracket from mounting bracket (3G).

c. Assembly.

(1) Install angle bracket (3M) on mounting bracket (3G), and secure in place with one machine screw (3L) one lockwasher (3F).



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KEY to fig. 89:

- 1—No. 8-32 X 5/16 hex-soc setscrew (2)
- 2—Plastic knob
- 3—Synchro transmitter subassembly
 - A—No. 6-40 X 1/4 fil-hd machine screw (5)
 - B—No. 6 lockwasher (5)
 - C—Transmitter synchro
 - D—No. 4-40 X 3/16 fil-hd machine screw
 - E—No. 4-40 X 3/16 fil-hd machine screw (4)
 - F—No. 4 lockwasher (5)
 - G—Bracket
 - H—Drive washer
 - J—Coupling shaft
 - K—Sleeve bearing
 - L—No. 4-40 X 1/4 fil-hd machine screw
 - M—Angle bracket
 - N—0.125-in-id flat washer
- 4—Target oscillator housing
- 5—No. 8-32 X 3/8 fil-hd machine screw (2)
- 6—No. 8 lockwasher (2)
- 7—3/16-in-id flat washer (2)

Figure 89. Synchro transmitter subassembly—exploded view.

(2) Slide sleeve bearing (3K) on shaft of transmitter synchro (3C).

(3) Screw drive washer (3H) on shaft of transmitter synchro (3C) until it is against sleeve bearing (3K).

(4) Slide the coupling shaft onto the shaft of transmitter synchro (3C) until it is against the drive washer.

(5) Bend two tangs of the drive washer until they contact coupling shaft (3J), and bend the other two tangs of the drive washer until they contact sleeve bearing (3K).

(6) Insert the coupling shaft attached to the transmitter synchro through bracket (3G) and angle bracket (3M).

(7) Secure the transmitter synchro to the bracket with four lockwashers and machine screws (3F and 3E).

d. Installation.

(1) Place synchro transmitter subassembly (3) into target oscillator housing (4), inserting

coupling shaft (3J) through the hole in the housing.

(2) Secure the synchro transmitter subassembly to the target oscillator housing with two flat washers, lockwashers, and machine screws (7, 6, and 5).

(3) Adjust machine screw (3D) to give 5 to 15 inch-ounces friction torque on coupling shaft (3J).

(4) Place plastic knob (2) on the coupling shaft, and secure the knob to the shaft with two setscrews (1).

(5) Attach five marked wire leads to the synchro transmitter subassembly with five lockwashers and machine screws (3B and 3A). Refer to figure 88 for proper connections.

169. Installation of Target Oscillator

Install the target oscillator into the electrical equipment drawer as instructed in paragraph 156.

Section VII. TEST SET MONITOR INDICATOR PANEL

170 (Deleted)

Note. Remove and install the test set monitor panel as necessary for maintenance in accordance with paragraphs 144 (removal) and 155 (installation).

171. DC Meter

a. Removal.

Note. The threads of round nut (2, fig. 90) are coated with sealing compound. Exercise care to avoid damaging the nut.

Remove the DC meter (fig. 90).

b. Installation.

(1) Apply a thin coat of adhesive MIL A25457 to both sides of gasket (10, fig. 90).

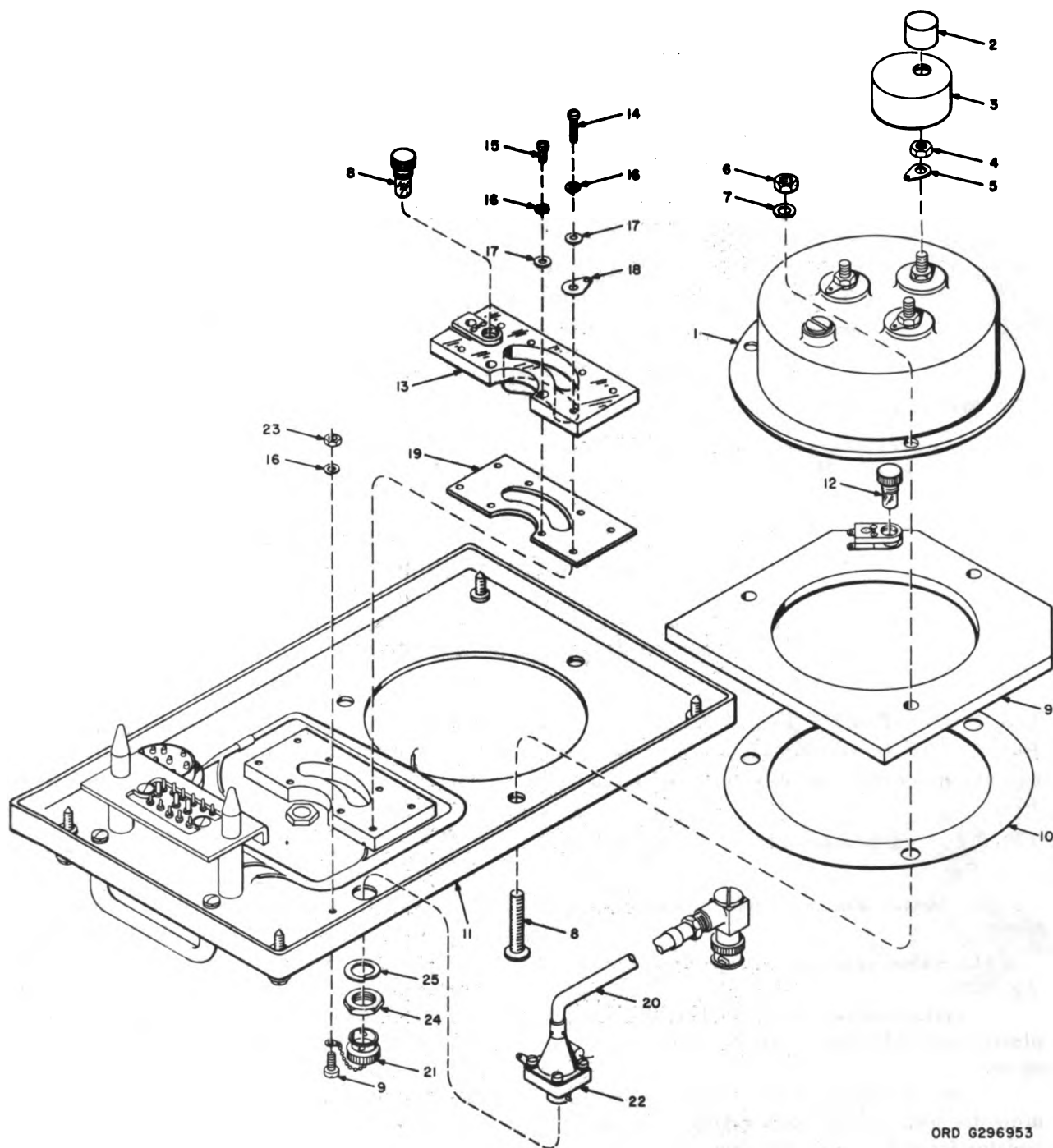
Install the gasket, meter window (9), and dc meter (1) on the marked mounting panel (11), using the attaching hardware (6, 7, and 8).

(2) Using figure 91 as a guide for wiring, position the lug terminals (5), and secure with the hexagon nuts (4).

Note. Do not put compound in the probe hole when applying on the threads of the nut.

(3) Apply a thin coat of sealing compound MIL-S-11031 to the threads of round nut (2), and secure the cover (3) over the V terminal. The wire lead passes through the cover slot.

(4) Install two incandescent lamps (12).



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- 1—Dc meter
- 2—Nut
- 3—Cover
- 4—Hexagon nut
- 5—Lug terminal
- 6—No. 10-24 hex nut (3)
- 7—No. 10 lockwasher (3)
- 8—No. 10-24 x 1- $\frac{1}{2}$ bind-hd machine screw (3)
- 9—Meter window
- 10—Gasket
- 11—Marked mounting panel
- 12—Incandescent lamp (2)
- 13—Dial window

- 14—No. 4-40 x $\frac{1}{2}$ pan-hd machine screw (6)
- 15—No. 4-40 x $\frac{5}{16}$ pan-hd machine screw (3)
- 16—No. 4 lockwasher (9)
- 17— $\frac{1}{8}$ -in-id flat washer (8)
- 18—Lug terminal
- 19—Gasket
- 20—Cable assembly
- 21—Electrical connector cover
- 22—Connector
- 23—No. 4-40 hex nut
- 24— $\frac{1}{2}$ -28 hex nut
- 25— $\frac{3}{8}$ -in-id lockwasher

Figure 90. Test set monitor indicator panel—exploded view.

112.35

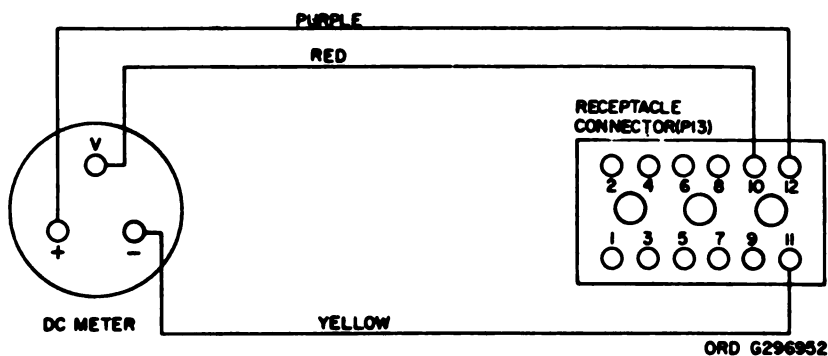


Figure 91. Dc meter—wiring diagram.

172. Miscellaneous Components

Remove and install components (fig. 90).

Note. Before installing the gasket (19, fig. 90), apply a thin coating of adhesive MIL-A-25457 to both sides of the gasket.

173, 174. (Deleted)

Section VIII. (Deleted)**Section IX. RF POWER METER****178. Removal of RF Power Meter**

Remove RF power meter (1, fig. 80) from equipment drawer as instructed in paragraph 146.

179. Mounted Components—Mounting Panel**a. Removal.**

Note. Identify wire leads and corresponding terminals.

(1) *Removal of variable resistor (4, 6, or 7, fig. 92).*

(a) Loosen two setscrews (2), and remove plastic knob (3) from shaft of variable resistor (4).

(b) Unscrew and remove dust and moisture seal boot (5), and remove the variable resistor from the mounting panel.

Note. Omit (c) below for variable resistor (7).

(c) Unsolder wire leads from variable resistor. Identify the wire leads and their terminals.

(2) (Deleted)

(3) (Deleted)

(4) *Removal of rotary switch (10 or 12) or switch assembly (13).*

112.36

(a) Loosen two setscrews (8), and remove knob (9) from shaft of rotary switch (10).

(b) Drive straight pin (11) from the shaft of the rotary switch.

(c) Unscrew and remove dust and moisture seal boot (5), and remove the rotary switch from the mounting panel.

Note. Omit (d) below for switch assembly (13).

(d) Unsolder the wire leads on rotary switch. Identify the leads and their terminals.

(5) (Deleted)

(6) (Deleted)

(7) *Removal of fuseholder (14).*

Note. There are two fuseholders mounted on the panel. One is used to hold a spare fuse and is not connected in the circuit.

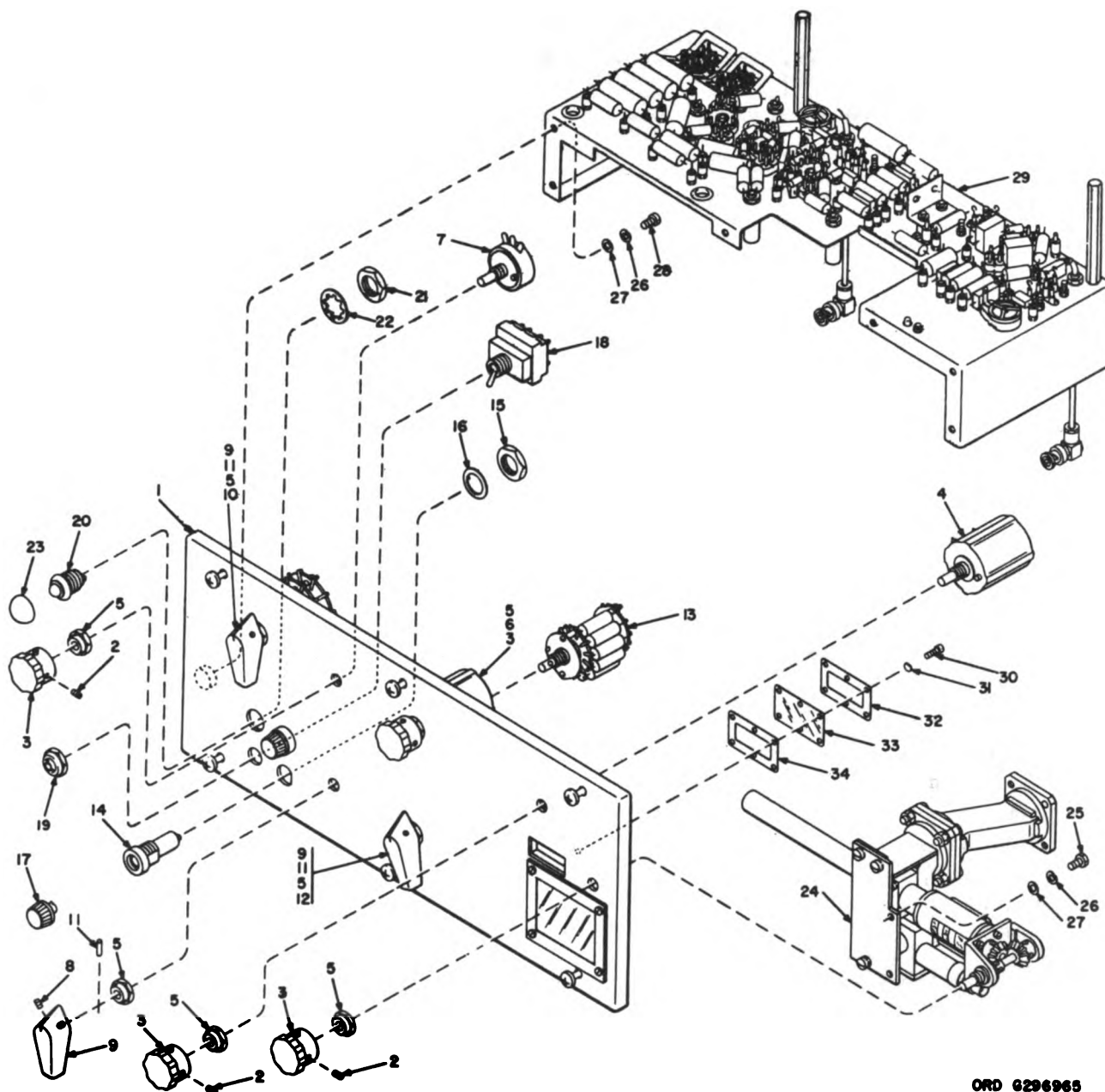
(a) Unsolder wires on fuseholder (14).

(b) Remove hexagon nut (15) from the fuseholder.

(c) Remove the fuseholder and attached neoprene washer (16) and fuseholder knob (17) from the mounting panel.

(8) *Removal of toggle switch (18).*

(a) Unscrew and remove seal nut (19) from toggle switch (18).



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Figure 92. RF power meter—exploded view.

- | | |
|--|--|
| 1 — Mounting panel 8018348 | 19 — Seal nut 7627160 |
| 2 — No. 8-32 x 5/16 hex-soc setscrew MS51963-36 (8) | 20 — Pushbutton switch (S5) 8175879 |
| 3 — Plastic knob 7599369 | 21 — 13/16 hex nut |
| 4 — Variable resistor (R23) 8023451 | 22 — 7/8-in-od int-teeth lockwasher |
| 5 — Dust and moisture seal boot 8175448 | 23 — Rubber electric cap 8175371 |
| 6 — Variable resistor (R7) 8023450 | 24 — Wavemeter and thermistor assembly 8018357 |
| 7 — Variable resistor (R48) RA20A1RD501AK | 25 — No. 8-32 x 3/8 slotted hex-hd machine screw 9000803 (2) |
| 8 — No. 6-32 x 3/16 hex-soc setscrew MS35017-21 | 26 — No. 8 lockwasher MS35338-42 (8) |
| 9 — Knob MS90120-1G01 (3) | 27 — 3/16-in-id flat washer MS27183-7 (8) |
| 10 — Rotary switch (S2) 8023675 | 28 — No. 8-32 x 5/16 fl-h machine screw MS35265-42 (6) |
| 11 — 1/4 dia, 7/16-in-lg headless straight pin 8015584 | 29 — Marked chassis 8517105 |
| 12 — Rotary switch (S3) 8516021 | 30 — No. 4-40 x 3/8 fl-h machine screw MS35265-15 (6) |
| 13 — Switch assembly (S4) 8018351 | 31 — No. 4 lockwasher MS35338-40 (6) |
| 14 — Fuseholder 8175627 (2) | 32 — Plate 8018353 |
| 15 — 5/8-18 hex nut (2) | 33 — Window 8018355 |
| 16 — 11/16-in-id neoprene washer (2) | 34 — Gasket 8018354 |
| 17 — Fuseholder knob (2) | |
| 18 — Toggle switch (S1) MS25068-23 | |

Figure 92. RF power meter—exploded view—legend.

- (b) Remove the toggle switch from the mounting panel.
- (c) Unsolder wire leads on toggle switch.
- (9) *Removal of pushbutton switch (20).*
 - (a) Unsolder wire leads on pushbutton switch (20).
 - (b) Unscrew and remove hexagon nut (21) from the switch.
 - (c) Remove lockwasher (22) from the switch.
 - (d) Remove the switch and attached cap (23) from the mounting panel.
- b. *Installation.*
 - (1) *Installation of pushbutton switch (20).*
 - (a) Install pushbutton switch (20) and attached cap (23) into mounting panel (1). Secure the switch with lockwasher (22) and hexagon nut (21).
 - (b) Connect wire leads to switch (20).
 - (2) *Installation of toggle switch (18).*
 - (a) Install toggle switch (18) on mounting panel (1) and secure in place with one seal nut (19).

Note. Install toggle switch so that switch is on when bat handle is in up position.

 - (b) Connect wire leads to toggle switch.
 - (3) *Installation of fuseholder (14).*

Note. There are two fuseholders mounted on the panel. One is used to hold a spare fuse and is not connected in the circuit.

 - (a) Insert fuseholder (14) and attached neoprene washer (16) and fuseholder knob (17) into mounting panel (1). Secure in place with one hexagon nut (15).
 - (b) Connect wire leads to fuseholder (14).
 - (4) *Installation of rotary switch (12).*
 - (a) Connect wire leads to rotary switch (12).
 - (b) Insert shaft of rotary switch through mounting panel, (1) insuring that tab on rotary switch fits into hole on rear of mounting panel.
 - (c) Secure rotary switch to mounting panel with dust and moisture seal boot (5).
 - (d) Insert straight pin (11) into shaft of rotary switch.
 - (e) Place knob (9) on shaft of rotary switch and secure in place with two setscrews (8).
 - (5) *Installation of rotary switch (10).*
 - (a) Connect wire leads to rotary switch.
 - (b) Install the switch following the procedures outlined in (4) (b) through (e) above.
 - (6) *Installation of switch assembly (13).*

Install the switch following the procedures outlined in (4) (b) through (e) above.
 - (7) *Installation of variable resistor (4).*

Note. Position variable resistor so that terminals point toward fuseholder end of mounting panel.

 - (a) Insert shaft of variable resistor through mounting panel (1) and secure with dust and moisture seal boot (5).

- (b) Connect wire leads to variable resistor.
- (c) Place plastic knob on shaft of variable resistor and secure the knob with two setscrews (2).
- (8) *Installation of variable resistor (6).*
Install the variable resistor following the procedures outlined in (7) above.
- (9) *Installation of variable resistor (7).*
 - (a) Insert shaft of variable resistor (7) through mounting panel.
 - (b) Position variable resistor with its terminals pointing toward the top of mounting panel (1). Secure the resistor to the panel with dust and moisture seal boot (5).
 - (c) Place plastic knob (3) on shaft of variable resistor and secure the knob with two setscrews (2).

180. Removal and Installation of Wave-meter and Thermistor Assembly

a. Removal.

- (1) Loosen two setscrews (2, fig. 92) and remove plastic knob (3) from shaft of wavemeter and thermistor assembly (24).
- (2) Unscrew and remove dust and moisture seal boot (5) from shaft of wavemeter and thermistor assembly.
- (3) Disconnect connector marked P15 (fig. 93) from receptacle J15 and connector marked P14 from receptacle J14.
- (4) Remove variable resistors (4 and 6, fig. 92) following procedures outlined in paragraph 179a(1) and (2).
- (5) Remove two machine screws (25), two lockwashers (26), and two flat washers (27) which secure wavemeter and thermistor assembly to mounting panel (1).
- (6) Remove six machine screws (28), six lockwashers (26), and six flat washers

(27) which secure mounting panel (1) to marked chassis (29).

- (7) Separate mounting panel from marked chassis as much as possible without damaging or breaking fragile solder joints.
- (8) Slide wavemeter and thermistor assembly approximately 1 inch from mounting panel. Lower gear end of wavemeter and thermistor assembly and remove wavemeter and thermistor assembly from mounting panel and marked chassis.

b. Disassembly of Wavemeter and Thermistor Assembly.

- (1) Remove four hexagon nuts (1, fig. 94) four lockwashers (2), and four machine screws (8), and remove waveguide assembly (4) from wavemeter connector (5). Remove two setscrews (6).
- (2) Remove one machine screw (7), one lockwasher (2), and one flat washer (8) which secure plate (9) to thermistor mount (10).

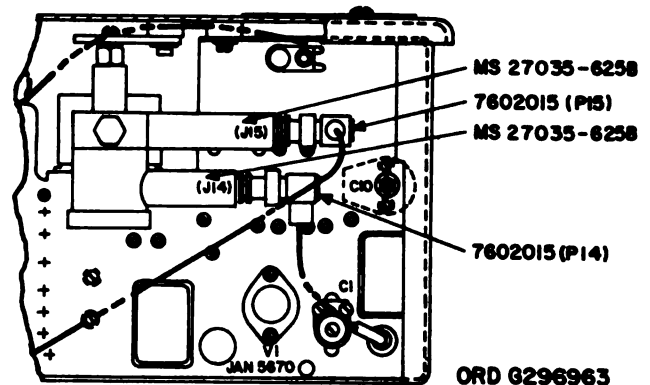
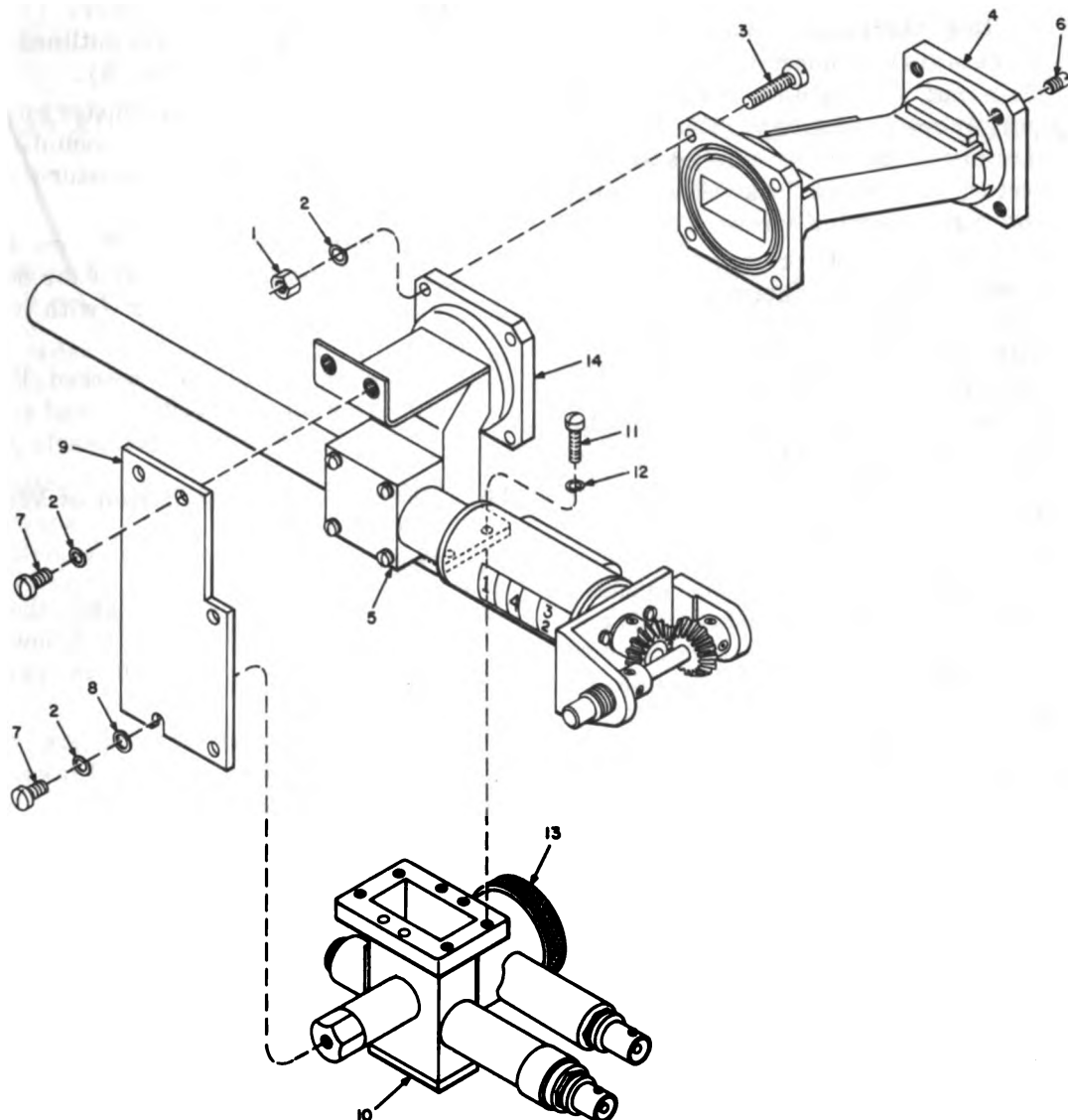


Figure 93. RF power meter—partial bottom rear view.



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- | | |
|---|--|
| 1 — No. 8-32 hex nut MS35649-82 (4) | 8 — 0.375-in-od flat washer 7602755 |
| 2 — No. 8 lockwasher MS35338-42 (7) | 9 — Plate 8021589 |
| 3 — No. 8-32 x 3/4 fil-h machine screw MS35265-47 (4) | 10 — Thermistor mount 8010866 |
| 4 — Waveguide assembly 8517108 | 11 — No. 4-40 x 3/8 fil-h machine screw MS35265-15 (8) |
| 5 — Wavemeter connector 8021595 | 12 — No. 4 lockwasher MS35338-40 (8) |
| 6 — No. 8-32 x 1/4 setscrew 8176083 (2) | 13 — Plain nut 9154353 |
| 7 — No. 8-32 x 3/8 fil-h machine screw MS35265-43 (8) | 14 — Waveguide cover flange MS90061-51 |

Figure 94. Wavemeter and thermistor assembly—exploded view.

(3) Remove two machine screws (7) and two lockwashers (2) which secure plate (9) to wavemeter connector (5). Remove the plate.

(4) Remove eight machine screws (11) and eight lockwashers (12), and remove thermistor mount (10) from wavemeter connector (5).

c. Assembly of Wavemeter and Thermistor Assembly.

- (1) Position thermistor mount (10) on wavemeter connector (5) so that plain nut (13) points toward waveguide cover flange (14). Secure thermistor mount to wavemeter connector with eight lockwashers (12) and eight machine screws (11).
- (2) Position plate (9) on wavemeter connector (5) and thermistor mount (10). Secure the plate to connector with two lockwashers (2) and two machine screws (7). Secure the plate to the thermistor mount with one flat washer (8), one lockwasher (2), and one machine screw (7).
- (3) Aline waveguide assembly (4) on cover flange (14) of the wavemeter connector. Secure with four machine screws (3), four lockwashers (2), and four hexagon nuts (1). Install two setscrews (6) on the waveguide assembly.

d. Installation of Wavemeter and Thermistor Assembly.

- (1) Separate mounting panel (1, fig. 92) from marked chassis (29) as much as possible without damaging or breaking fragile solder joints.
- (2) Lower gear end of wavemeter and thermistor assembly (24) and place the assembly between the mounting panel and the marked chassis.
- (3) Insert the shaft on wavemeter and thermistor assembly through the mounting panel.
- (4) Secure wavemeter and thermistor assembly to the mounting panel with two flat washers (27), two lockwashers (26), and two machine screws (25).
- (5) Secure the mounting panel to the marked chassis with six flat washers (27), six lockwashers (26), and six

machine screws (28).

- (6) Install variable resistors (4 and 6) following procedures outlined in paragraph 179b(7) and (8).
- (7) Secure shaft of wavemeter and thermistor assembly to the mounting panel with one dust and moisture seal boot (5).
- (8) Place plastic knob (3) on shaft of wavemeter and thermistor assembly and secure in place with two set-screws (2).
- (9) Connect connector marked P14 (fig. 93) with receptacle J14 and connector marked P15 with receptacle J15.

181. Removal and Installation of Window and Gasket

a. Removal.

- (1) Remove wavemeter and thermistor assembly (24, fig. 92) following the procedures outlined in paragraph 180a.
- (2) Unscrew and remove six machine screws (30) and six lockwashers (31).
- (3) Remove plate (32), window (33), and gasket (34) from mounting panel (1).

b. Installation.

- (1) Place gasket (34), window (33), and plate (32) in the order given on mounting panel (1).
- (2) Secure the items with six lockwashers (31) and six machine screws (30).
- (3) Install wavemeter and thermistor assembly (24) following the procedures outlined in paragraph 180d.

182. Final Test and Installation of RF Power Meter

a. Test RF power meter as outlined in TM 9-1400-250-35/5/2.

b. Install RF power meter (1, fig. 80) in equipment drawer as instructed in paragraph 153.

Section X. (Deleted)**Section XI. (Deleted)****Section XII. MAINTENANCE OF RADAR TEST SET WAVEGUIDE ASSEMBLY
OR TEST SET SUBASSEMBLY****189. Removal of Radar Test Set Waveguide Assembly or Test Set Subassembly.**

Remove radar test set waveguide assembly or test set subassembly from equipment drawer as instructed in paragraph 149.

190. Electro-Mechanical Rotary Actuator**a. Removal.**

(1) Remove eight machine screws and lockwashers (1 and 2, fig. 95) which secure the wire leads to the motor-generator (3), and remove the leads.

Note. Identify wire leads and installation points upon removal if they are not already identified.

(2) Remove two machine screws (4) which secure the wire leads to sensitive switch (5), and remove the leads.

(3) Remove five machine screws and lockwashers (6 and 7) which secure the wire leads to synchro control transformer (8), and remove the leads.

(4) Remove three loop clamps (9) which secure wiring harness to electro-mechanical rotary actuator (10) by removing three machine screws and lockwashers (11 and 12).

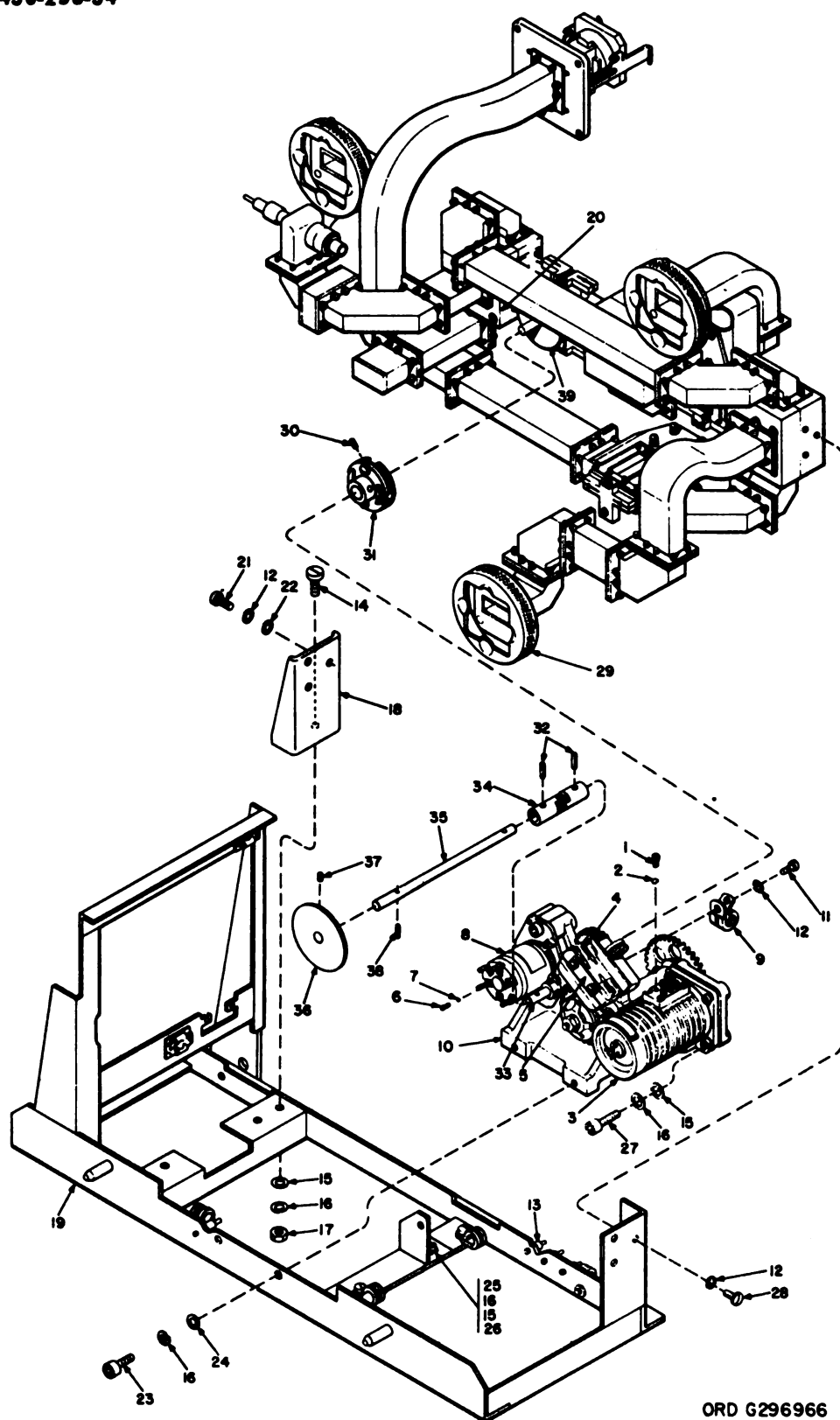


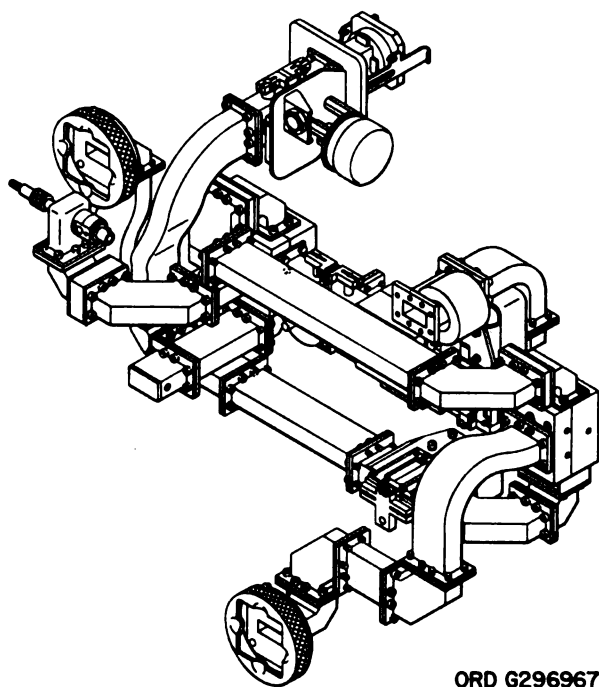
Figure 95. Radar test set waveguide assembly—partially exploded view.

- 1—No. 4-40 x 1/2 fl-h machine screw 131825 (8)
- 2—No. 4 lockwasher MS35338-40 (8)
- 3—Motor-generator 7605334
- 4—No. 3-48 x 1/2 rh machine screw 588011 (2)
- 5—Sensitive switch (S1) 7599567
- 6—No. 6-40 x 1/4 fl-h machine screw 225116 (5)
- 7—No. 6 lockwasher MS35338-41 (5)
- 8—Synchro control transformer MIL-S-20708-15
- 9—Loop clamp NAS1397K3N (3)
- 10—Electro-mechanical rotary actuator 8024079
- 11—No. 8-32 x 3/8 fl-h machine screw MS35265-48 (3)
- 12—No. 8 lockwasher MS35338-42 (6)
- 13—Standoff insulator 7599087 (3)
- 14—No. 10-24 x 5/8 fl-h machine screw MS35206-264 (2)
- 15—1/4-in-id flat washer MS27183-9 (5)
- 16—No. 10 lockwasher MS35338-43 (7)
- 17—No. 10-24 hex nut MS35649-102 (2)
- 18—Waveguide bracket 8016787
- 19—Frame 8517117 p/o waveguide assembly 9983719, frame 9144763 p/o test set subassembly 9989352
- 20—Directional coupler 8007729
- 21—No. 8-32 x 1/2 fl-h machine screw MS35206-245 (3)
- 22—3/16-in-id flat washer MS27183-7 (3)
- 23—No. 10-24 x 5/8 hex-soc cap screw MS16997-45 (2)
- 24—0.219-in-id flat washer MS27183-8 (2)
- 25—No. 10-24 x 3/8 fl-h machine screw MS35206-261 (2)
- 26—Bracket 8024109
- 27—No. 10-24 x 3/4 hex-soc cap screw MS16997-46
- 28—No. 8-32 x 3/8 pan-hd machine screw MS35206-243 (3)
- 29—Waveguide assembly 8024108 p/o waveguide assembly 9983719, waveguide assembly 9144724 p/o test set subassembly 9989352¹
- 30—No. 6-32 x 3/16 hex-soc setscrew 8024507 (4)
- 31—Flexible coupling 8020971
- 32—0.078 x 1/2 spring pin MS16562-203 (2)
- 33—Bearing assembly 8024075
- 34—Universal joint 8021732
- 35—Shaft 8024211
- 36—Dial control 9154569
- 37—No. 8-32 x 1/8 hex-soc setscrew MS51963-33 (2)
- 38—Spring pin MS16562-192
- 39—Variable attenuator 8171860

¹ See figure 96 for Improved configuration.

Figure 95. Radar test set waveguide assembly—partially exploded view—legend.

- (5) Remove the wiring harness from the electro-mechanical rotary actuator.
- (6) Unsolder the wire leads on the three standoff insulators (13).



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Figure 96. Waveguide assembly 9144724—part of test set subassembly 9989352.

- (7) Remove two machine screws (14), two flat washers (15), two lockwashers (16), and two hexagon nuts (17), which secure waveguide bracket (18) to frame (19).
- (8) Disconnect waveguide bracket (18) from directional coupler (20) by removing three machine screws (21), three lockwashers (12), and three flat washers (22). Remove the bracket.
- (9) Remove two cap screws (23), two lockwashers (16), and two flat washers (24), which connect electro-mechanical rotary actuator (10) to frame (19).
- (10) Remove two machine screws (25), two lockwashers (16), and two flat washers (15) which secure bracket (26) to frame (19).
- (11) Remove cap screw (27), lockwasher (16), and flat washer (15) which connect the electro-mechanical rotary actuator (10) to bracket (26). Remove the bracket.
- (12) Remove three machine screws (28) and three lockwashers (12) which connect waveguide assembly (29) to frame (19), and remove the waveguide assembly and the electro-me-

chanical rotary actuator (10) from the frame.

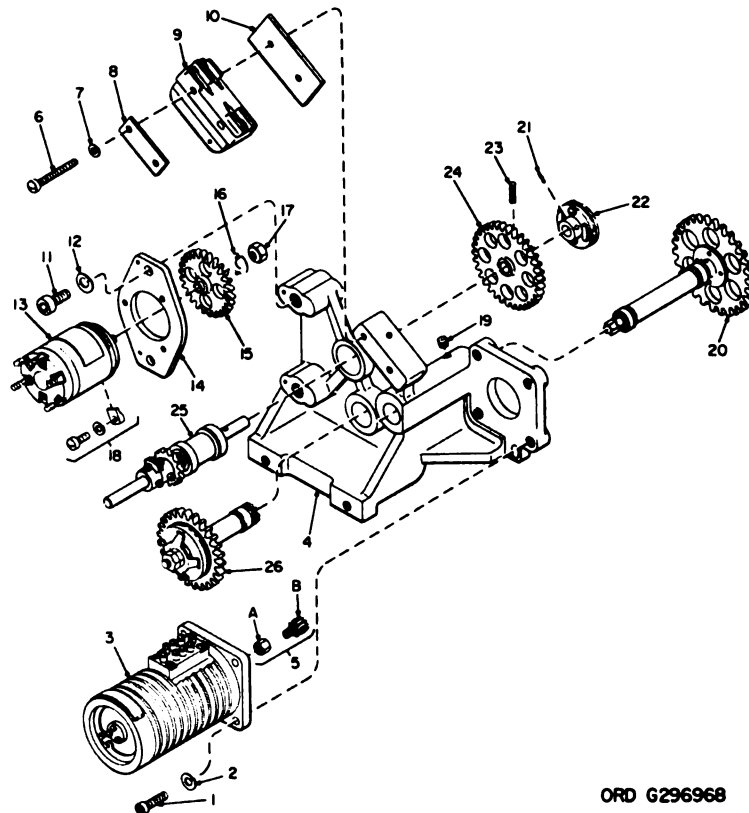
- (13) Remove four hexagon-socket set-screws (30) on the waveguide side of flexible coupling (31) and remove the electro-mechanical rotary actuator (10) from the waveguide assembly (29).

b. Disassembly.

- (1) Remove spring pin (32) which secures bearing assembly (33) on electro-mechanical rotary actuator (10) to universal joint (34). Remove uni-

versal joint shaft (35) and dial control (36) from the electro-mechanical rotary actuator.

- (2) Disassemble universal joint (34), shaft (35), and dial control (36) as shown in figure 95. Remove four cap screws (1, fig. 97), and four lock-washers (2) which secure motor-generator (3) to gear housing (4) and remove the motor-generator.
- (3) Loosen lock nut (5A) on gear (5B) and remove spur gear subassembly



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Figure 97. Electro-mechanical rotary actuator—exploded view.

- | | |
|---|---|
| 1 — No. 8-32 x 5/8 hex-soc cap screw MS16997-33 (4) | 12 — No. 10 lockwasher MS35338-24 (2) |
| 2 — No. 8 lockwasher MS35338-42 (4) | 13 — Synchro control transformer MIL-S-20708-15 |
| 3 — Motor-generator 7605334 | 14 — Mounting plate 8016757 |
| 4 — Gear housing 8024096 | 15 — Spur gear 8024067 |
| 5 — Spur gear subassembly 8024069 | 16 — Drive washer Bu Ord 643090 |
| A — Lock nut 7604253 | 17 — No. 10-32 hex nut Bu Ord 644594 |
| B — Gear 8024068 | 18 — Clamp assembly Bu Ord 643019 |
| 6 — No. 6-32 x 1-1/4 fil-h machine screw MS35265-35 (2) | 19 — No. 6-32 x 3/16 setscrew (6) |
| 7 — No. 6 lockwasher MS35338-41 (2) | 20 — Gear assembly 8024064 |
| 8 — Mounting plate 7598348 | 21 — Spring pin MS16562-203 |
| 9 — Sensitive switch 7599567 | 22 — Flexible shaft coupling 8020971 |
| 10 — Plate insulator 8008281 | 23 — Spring pin MS16562-202 |
| 11 — No. 10-24 x 1/2 hex-soc cap screw MS16997-44 (2) | 24 — Spur gear 8170728 |
| | 25 — Bearing assembly 8024075 |
| | 26 — Friction clutch 8024066 |

Figure 97. Electro-mechanical rotary actuator—exploded view—legend.

(5) from the shaft of the motor-generator.

Note. Do not remove spur gear subassembly (5) unless it has to be replaced. Gear (5B) is a fiber product easily damaged.

- (4) Remove two machine screws (6) and two lockwashers (7) and pull mounting plate (8), sensitive switch (9), and plate insulator (10) from gear housing (4).
- (5) Remove two cap screws (11) and two lockwashers (12), which secure synchro control transformer (13) to gear housing (4). Remove the transformer with mounting plate (14) and spur gear (15) from the gear housing.
- (6) Straighten bent tangs on drive washer (16) and remove hexagon nut (17). Pull spur gear (15) from the shaft of synchro control transformer (13).
- (7) Remove three clamp assemblies (18) which secure the transformer to the plate, and remove the transformer from the plate.
- (8) Loosen six setscrews (19) on gear housing (4).
- (9) Remove gear assembly (20) from gear housing.
- (10) Remove spring pin (21) from coupling (22) and spring pin (23) from spur gear (24).
- (11) Remove coupling (22) and spur gear (24) from shaft of bearing assembly (25).
- (12) Remove bearing assembly (25) from gear housing (4).

(13) Remove friction clutch (26) from gear housing.

c. Assembly.

- (1) Install friction clutch (26) in gear housing (4).
- (2) Install bearing assembly (25) in gear housing (4), meshing gear teeth with the teeth of friction clutch (26).
- (3) Install spur gear (24) on shaft of bearing assembly (25), meshing gear teeth with the teeth of the friction clutch. Secure in place with pin (23).
- (4) Install coupling (22) on shaft of bearing assembly (25). Secure in place with pin (21).
- (5) Install gear assembly (20) in gear housing (4), meshing front gear teeth with the teeth of friction clutch (26).
- (6) Tighten six setscrews (19) located on gear housing (4).
- (7) Install synchro control transformer (13) on mounting plate (14) and secure with three clamp assemblies (18).
- (8) Install spur gear (15) on the shaft of synchro control transformer. Position the gear so that its shoulder faces the transformer. Align and bend down two tangs of drive washer (16) onto the spur gear, and secure with one hexagon nut (17). Bend the remaining tangs of drive washer over the hexagon nut.
- (9) Install the synchro control transformer and attached spur gear and mounting plate on gear housing (4).

and secure with two cap screws (11) and two lockwashers (12).

- (10) Aline plate insulator (10), sensitive switch (9), and mounting plate (8) with gear housing (4) and secure with two machine screws (6) and two lockwashers (7).
- (11) Install one locknut (5A) and gear (5B) on shaft of motor-generator (3) and tighten the lock nut to secure spur gear subassembly (5) on the shaft.
- (12) Install motor-generator (3) on gear housing (4) and secure the motor-generator to the housing with four cap screws (1) and four lockwashers (2).

Note. New shafts (35, fig. 95) are furnished with a hole $31/32$ inch from one end. Prior to installing a new shaft, drill one $0.078 + 0.008$ -inch-diameter hole through the shaft $8/16$ inch from the end of the shaft farthest from the predrilled hole. Similarly, new universal joints (34) are furnished with one 0.06 -inch-diameter pilot hole at each end. Prior to installing a new shaft, drill one $0.078 + 0.003$ -inch-diameter hole through each end of the universal joint, using the 0.06 -inch pilot holes as guides.

- (13) Insert shaft (35, fig. 95), predrilled end first, through the rear of dial control (36) until approximately $1-1/2$ inch of the shaft is through the dial control. Secure the dial control to the shaft with two setscrews (37).
- (14) Drive one spring pin (38) into predrilled hole in the shaft until the ends of the pin protrude the same amount from the sides of the shaft.
- (15) Insert the shaft with attached dial control into universal joint (34), aline holes, and secure the shaft to the universal joint with one spring pin (32).
- (16) Install the universal joint and attached shaft and dial assembly on the shaft of bearing assembly (33). Aline the holes, and secure the universal joint to the shaft of the bearing assembly with one spring pin (32).
- (17) Apply a light coat of aircraft and instrument grease 9150-261-8298 to all gear teeth.

d. Installation.

- (1) Place flexible coupling (31, fig. 95) on electro-mechanical rotary actuator onto shaft on variable attenuator (39). Apply sealing compound MIL-S-7502 to threads of four setscrews (30) and secure the coupling to the shaft with these setscrews.
- (2) Place the electro-mechanical rotary actuator (10) and waveguide assembly (29) into frame (19). Support the electro-mechanical rotary actuator to prevent possible damage to it and/or the flexible coupling and the shaft of the waveguide attenuator.
- (3) Apply antiseize compound 8030-251-3983 to threads of three machine screws (28). Secure the waveguide assembly to the frame with three lockwashers (12) and three machine screws (28).
- (4) Apply antiseize compound 8030-251-3983 to threads of cap screw (27) and secure bracket (26) to electro-mechanical rotary actuator with flat washer (15), lockwasher (16), and cap screw (27).
- (5) Apply antiseize compound 8030-251-3983 to threads of two machine screws (25). Secure bracket (26) to frame (19) with two flat washers (15), two lockwashers (16), and two machine screws (25).
- (6) Apply antiseize compound 8030-251-3983 to threads of two cap screws (23). Secure electro-mechanical rotary actuator (10) to frame (19) with two flat washers (24), two lockwashers (16), and two cap screws (23).
- (7) Secure waveguide bracket (18) to frame (19) with two machine screws (14), two flat washers (15), two lockwashers (16), and two hexagon nuts (17).
- (8) Apply antiseize compound 8030-251-3983 to threads of three machine screws (21). Secure waveguide bracket (18) to directional coupler (20)

on waveguide assembly (29) with three flat washers (22), three lockwashers (12), and three machine screws (21).

- (9) Connect wire leads from attenuator assemblies to three standoff insulators (13). Refer to figure 98 for proper connections.
- (10) Place wiring harness on electro-mechanical rotary actuator (10). Secure the harness with three loop clamps (9), three lockwashers (12), and three machine screws (11).
- (11) Install five wire leads on terminals of synchro control transformer (8) and secure in place with five lockwashers (7) and five machine screws (6).
- (12) Install two wire leads on sensitive switch (5) and secure in place with two machine screws (4). Refer to figure 99 for proper connections.
- (13) Install eight wire leads on terminals of motor-generator (3) and secure in place with eight lockwashers (2) and eight machine screws (1).

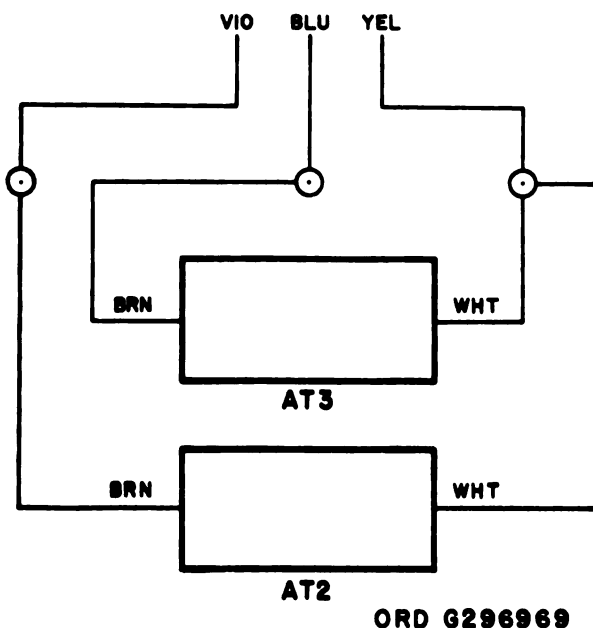


Figure 98. Attenuator assemblies—wiring diagram.

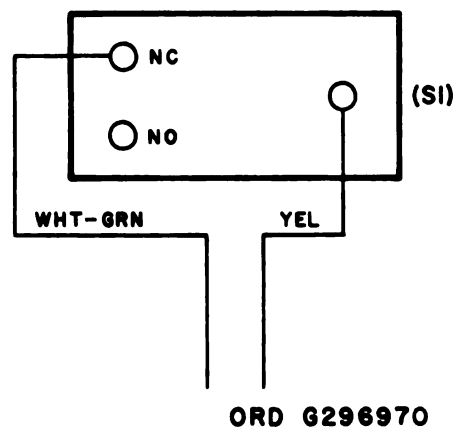


Figure 99. Sensitive switch—wiring diagram.

191. Removal and Installation of Waveguide Assembly 8024108 and 9144724

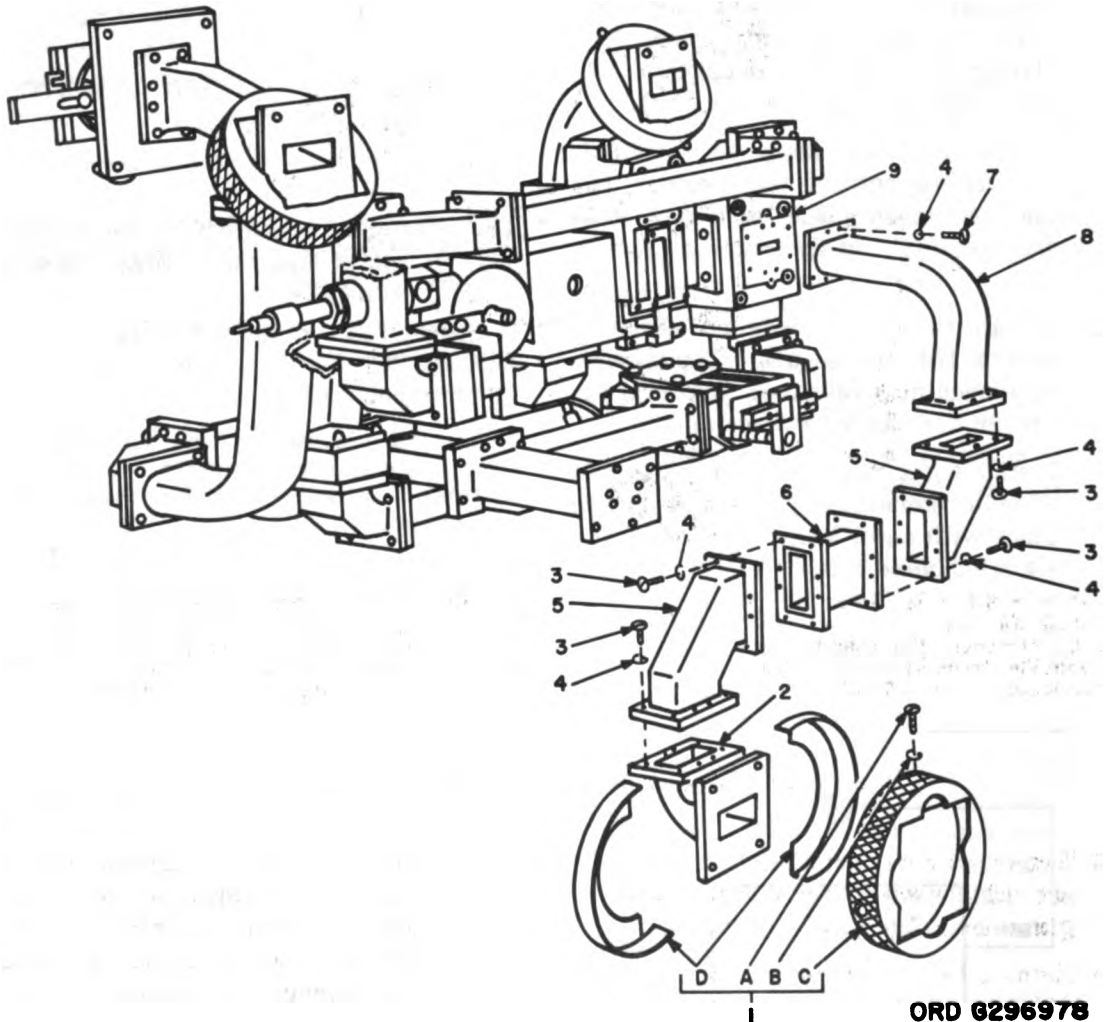
a Removal. Remove waveguide assembly (29, fig. 95) following the procedures outlined in paragraph 190a.

Note. The disassembly and assembly procedures given in paragraph 191 refer to waveguide assembly 8024108 and waveguide assembly 9144724 unless otherwise indicated.

b. Disassembly.

- (1) Remove four machine screws (1A, fig. 100) and four lockwashers (1B) and remove shell (1C) from shells (1D) in waveguide clamp (1). Lift off the two shells from waveguide assembly (2).
- (2) Remove eight machine screws (3) and eight lockwashers (4) which secure waveguide assembly (2) to waveguide assembly (5). Remove waveguide assembly (2).
- (3) Remove eight machine screws (3) and eight lockwashers (4) and remove waveguide assembly (5).
- (4) Remove eight machine screws (3) and eight lockwashers (4) and remove waveguide assembly (6).
- (5) Remove eight machine screws (3) and eight lockwashers (4) and remove waveguide assembly (5).
- (6) Remove eight machine screws (7) and eight lockwashers (4) and remove waveguide assembly (8).

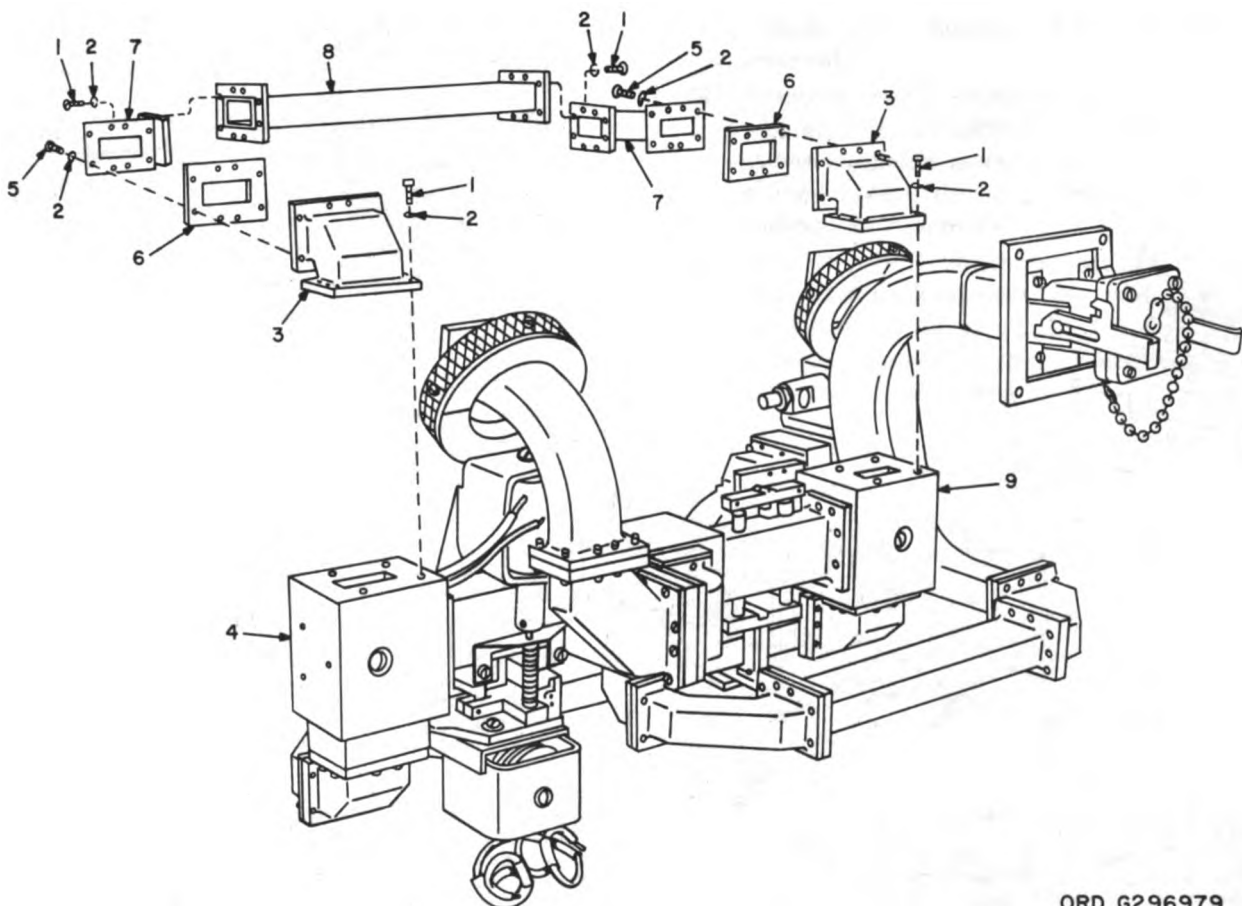
- (7) Remove six machine screws (1, fig. 101) and six lockwashers (2), which secure one flange of waveguide assembly (3) to directional coupler (4). Remove eight machine screws (5) and eight lockwashers (2) and remove waveguide assembly (3) with waveguide spacer (6).
- (8) Remove eight machine screws (1) and eight lockwashers (2) and remove waveguide assembly (7).
- (9) Remove eight machine screws (1) and eight lockwashers (2) and remove waveguide attenuator (8).
- (10) Remove eight machine screws (5) and eight lockwashers (2) and remove waveguide assembly (7) and spacer (6).



ORD 6296978

- | | |
|--|---|
| 1 — Waveguide clamp 8010911 (3) | 4 — No. 4 lockwasher MS35388-40 (40) |
| A — No. 4-40 x 3/8 fil-h machine screw MS35265-12 (4) | 5 — Waveguide assembly 8020923 (2) |
| B — No. 4 lockwasher MS35388-40 (4) | 6 — Waveguide assembly 8024115 |
| C — Shell 8010908 | 7 — No. 4-40 x 1/2 fil-h machine screw MS35267-17 (8) |
| D — Shell 8010912 (2) | 8 — Waveguide assembly 8170501 |
| 2 — Waveguide assembly 8024122 | 9 — Directional coupler (HY1) 8007729 |
| 3 — No. 4-40 x 3/8 fil-h machine screw MS35265-15 (32) | |

Figure 100. Waveguide assembly—partially exploded view.



ORD G296979

- 1 — No. 4-40 x 3/8 fil-h machine screw MS35265-15 (28)
- 2 — No. 4 lockwasher MS35338-40 (44)
- 3 — Waveguide assembly 8020918 (2)
- 4 — Directional coupler 8007729

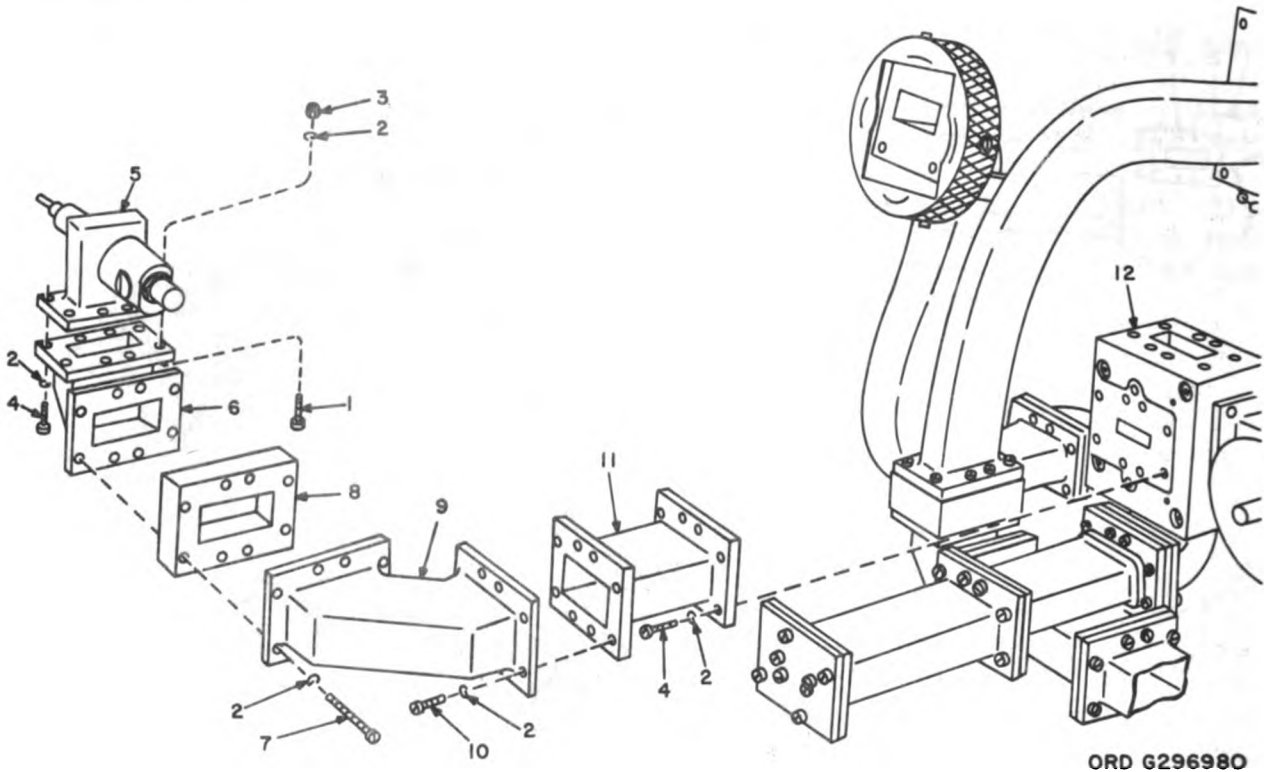
- 5 — No. 4-40 x 5/8 fil-h machine screw 131850 (16)
- 6 — Waveguide spacer 8024243 (2)
- 7 — Waveguide assembly 8020923 (2)
- 8 — Waveguide attenuator 8020934
- 9 — Directional coupler (HY3) 8007729

Figure 101. Waveguide assembly—partially exploded view.

- (11) Remove six machine screws (1) and six lockwashers (2) and remove waveguide assembly (3).
- (12) Remove two machine screws (1, fig. 102), two lockwashers (2), two hexagon nuts (3), four fillister-head machine screws (4), and four lockwashers (2) which secure detector (5) to waveguide assembly (6) and remove the detector.
- (13) Remove eight machine screws (7) and eight lockwashers (2) which secure waveguide assembly (6) and waveguide spacer (8) to waveguide assem-

- bly (9). Remove waveguide assembly (6) and waveguide spacer (8).
- (14) Remove eight machine screws (10) and eight lockwashers (2) which secure waveguide assembly (9) to waveguide assembly (11). Remove waveguide assembly (9).
- (15) Remove eight machine screws (4) and eight lockwashers (2) which secure waveguide assembly (11) to directional coupler (12). Remove the waveguide assembly.

Notes. The procedures outlined in (16) through (21) below refer to waveguide assembly 8024108.



- 1 — No. 4-40 x 1/2 fil-h machine screw MS35265-17 (2)
- 2 — No. 4 lockwasher MS35338-40 (30)
- 3 — No. 4-40 hex nut MS35649-42 (2)
- 4 — No. 4-40 x 3/8 fil-h machine screw MS35265-15 (12)
- 5 — RF detector 8020912

- 6 — Waveguide assembly 8020918
- 7 — No. 4-40 x 1 fil-h machine screw 131865 (8)
- 8 — Waveguide spacer 8517115
- 9 — Waveguide assembly 8020923
- 10 — No. 4-40 x 3/8 hex-hd machine screw 8176241 (8)
- 11 — Waveguide assembly 8170645
- 12 — Directional coupler (HY3) 8007729

Figure 102. Waveguide assembly—partially exploded view.

- (16) Remove waveguide clamp (1, fig. 103) following the procedure outlined in (1) above.
- (17) Remove eight machine screws (2) and eight lockwashers (3) which secure waveguide assembly (4) to waveguide assembly (5). Remove waveguide assembly (4). Remove eight machine screws (2) and eight lockwashers (3) which secure waveguide assembly (5) to waveguide assembly (6). Remove the waveguide assembly.
- (18) Remove eight machine screws (2) and eight lockwashers (3) which secure waveguide assembly (6) to waveguide assembly (7). Remove the waveguide assembly.

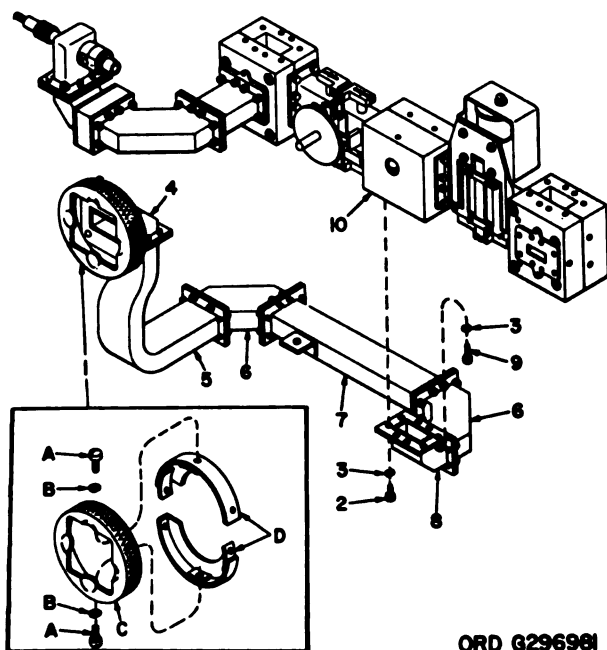
- (19) Remove eight machine screws (2) and eight lockwashers (3) which secure waveguide assembly (7) to waveguide assembly (6). Remove the waveguide assembly.
- (20) Remove eight machine screws (2) and eight lockwashers (3) which secure waveguide assembly (6) to waveguide assembly (8). Remove the waveguide assembly.
- (21) Remove two machine screws (9), six machine screws (2), and eight lockwashers (3) which secure waveguide assembly (8) to directional coupler (10). Remove the waveguide assembly.

Note. The procedures outlined in (22) through (28) below refer to waveguide assembly 9144724.

- (22) Remove waveguide clamp (1, fig. 104) following the procedure outlined in (1) above.
- (23) Remove eight machine screws (2, fig. 104) and eight lockwashers (3) which secure waveguide assembly (4) to waveguide assembly (5). Remove waveguide assembly (4). Remove eight machine screws (2) and eight lockwashers (3) which secure waveguide assembly (5) to waveguide as-

sembly (6). Remove the waveguide assembly.

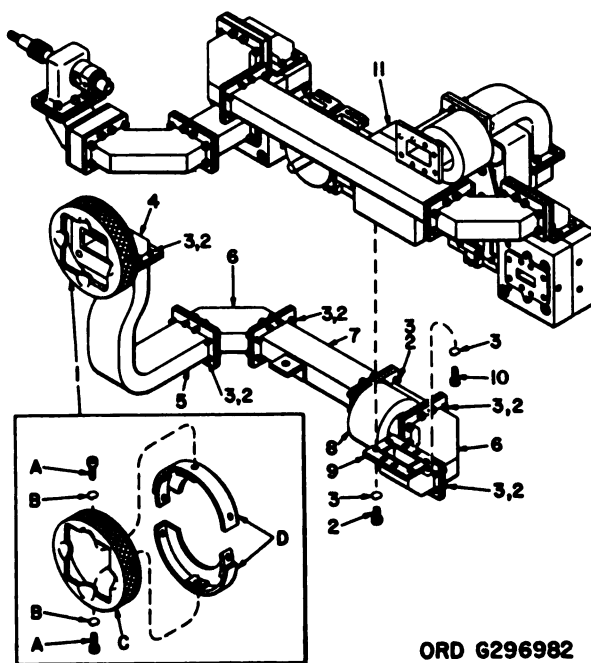
- (24) Remove eight machine screws (2, and eight lockwashers (3) which secure waveguide assembly (6) to waveguide assembly (7). Remove the waveguide assembly.
- (25) Remove eight machine screws (2) and eight lockwashers (3) which secure waveguide assembly (7) to RF reflection isolator (8). Remove the waveguide assembly.



ORD G296981

- 1 — Waveguide clamp 8010911
 - A — No. 4-40 x 3/8 fil-h machine screw MS35265-12 (4)
 - B — No. 4 lockwasher MS35338-40 (4)
 - C — Shell 8010908
 - D — Shell 8010912 (2)
- 2 — No. 4-40 x 3/8 fil-h machine screw MS35265-15 (46)
- 3 — No. 4 lockwasher MS35338-40 (48)
- 4 — Waveguide assembly 8024122
- 5 — Waveguide assembly 8170502
- 6 — Waveguide assembly 8020923 (2)
- 7 — Waveguide assembly 8517116
- 8 — Waveguide assembly 8020918
- 9 — No. 4-40 x 3/8 hex-hd machine screw 8176241 (2)
- 10 — Directional coupler (HY2) 8007729

Figure 103. Waveguide assembly 8024108—partially exploded view.



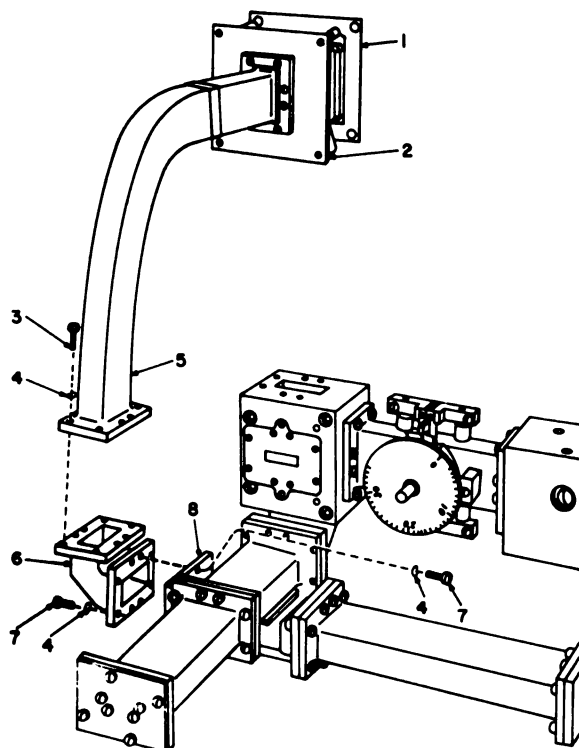
ORD G296982

- 1 — Waveguide clamp 8010911
 - A — No. 4-40 x 3/8 fil-h machine screw MS35265-12 (4)
 - B — No. 4 lockwasher MS35338-40 (4)
 - C — Shell 8010908
 - D — Shell 8010912 (2)
- 2 — No. 4-40 x 3/8 cross-recess pan-hd machine screw MS35206-215 (54)
- 3 — No. 4 lockwasher MS35338-40 (56)
- 4 — Waveguide assembly 8024122
- 5 — Waveguide assembly 8170502
- 6 — Waveguide assembly 8020923 (2)
- 7 — Waveguide assembly 9156488
- 8 — RF reflection isolator 9976418
- 9 — Waveguide assembly 8020918
- 10 — No. 4-40 x 3/8 hex-hd machine screw 8176241 (2)
- 11 — Directional coupler (HY2) 8007729

Figure 104. Waveguide assembly 9144724—partially exploded view.

- (26) Remove eight machine screws (2) and eight lockwashers (3) which secure isolator (8) to waveguide assembly (6). Remove the isolator.
- (27) Remove eight machine screws (2) and eight lockwashers (3) which secure waveguide assembly (6) to waveguide assembly (9).
- (28) Remove two machine screws (10), six machine screws (2), and eight lockwashers (3) which secure waveguide assembly (9) to directional coupler (11).

Note. The procedures outlined in (29) through (31) refer to waveguide assembly 8024108.



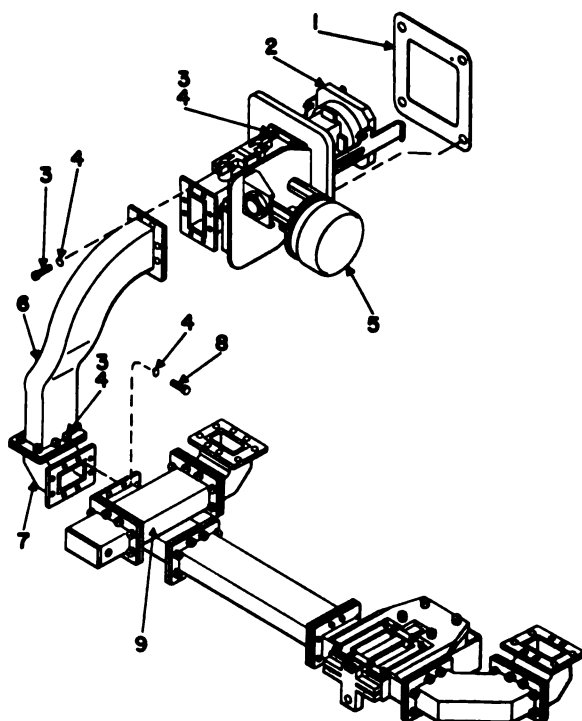
ORD G296983

- 1 — Gasket 8010995
- 2 — Waveguide clamp assembly 8170671
- 3 — No. 4-40 x 3/8 fil-h machine screw MS35265-15 (8)
- 4 — No. 4 lockwasher MS35338-40 (16)
- 5 — Waveguide assembly 8511991
- 6 — Waveguide assembly 8020917
- 7 — No. 4-40 x 3/8 hex-hd machine screw 8176241 (8)
- 8 — Directional coupler 8020942

Figure 105. Waveguide assembly 8024108—partially exploded view.

- (29) Remove gasket (1, fig. 105) from waveguide clamp assembly (2).
- (30) Remove eight machine screws (3) and eight lockwashers (4) which secure waveguide assembly (5) to waveguide assembly (6). Remove the waveguide assembly.
- (31) Remove eight hexagon-head machine screws (7) and eight lockwashers (4) which secure waveguide assembly (6) to directional coupler (8). Remove the waveguide assembly.

Note. The procedures outlined in (32) through (36) below refer to waveguide assembly 9144724.



ORD G296984

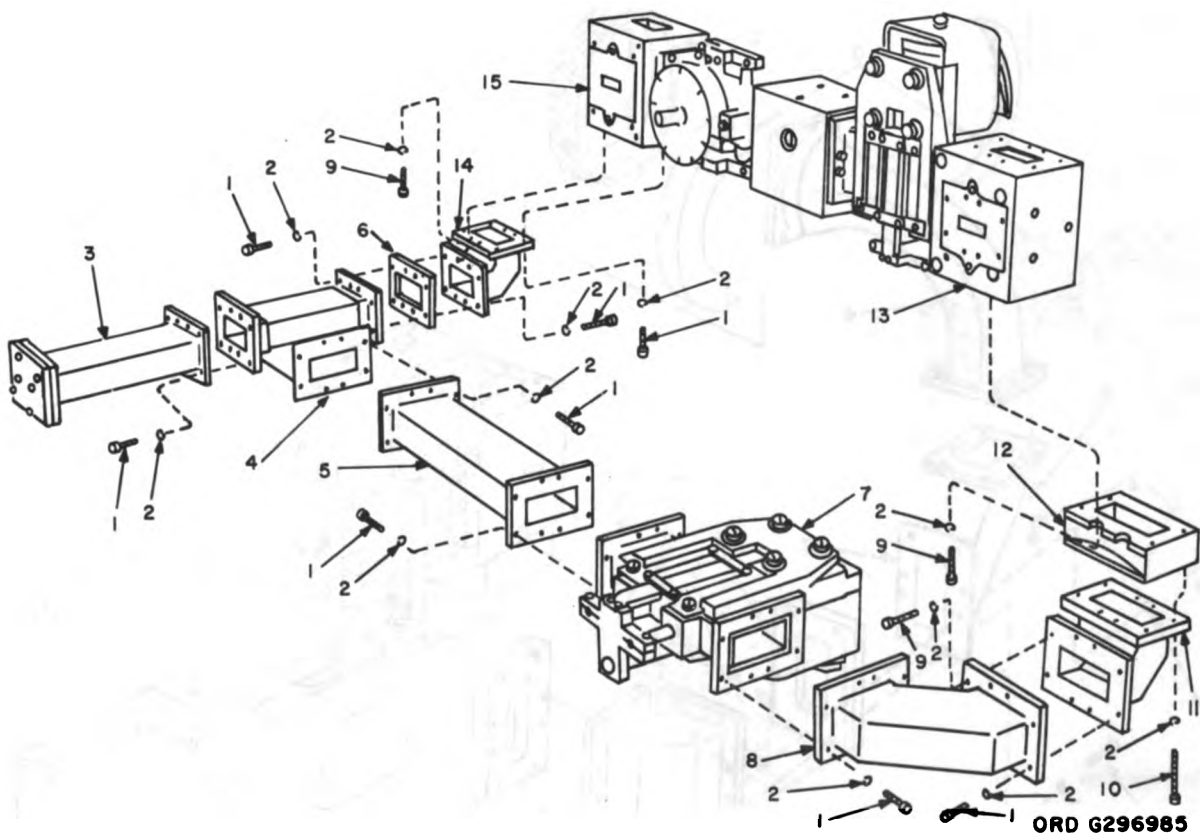
- 1 — Gasket 8010995
- 2 — Waveguide clamp assembly 8170671
- 3 — No. 4-40 x 3/8 cross-recess pan-hd machine screw MS35206-215 (24)
- 4 — No. 4 lockwasher MS35338-40 (32)
- 5 — Variable attenuator 9144759
- 6 — Waveguide assembly 9144760
- 7 — Waveguide assembly 8020917
- 8 — No. 4-40 x 3/8 hex-hd machine screw 8176241 (8)
- 9 — Waveguide assembly 9156490

Figure 106. Waveguide assembly 9144724—partially exploded view.

- (32) Remove gasket (1, fig. 106) from waveguide clamp assembly (2).
- (33) Remove eight screws (3) and eight lockwashers (4) which secure clamp assembly (2) to variable attenuator (5). Remove the clamp assembly.
- (34) Remove eight machine screws (3) and eight lockwashers (4) which secure attenuator (5) to waveguide assembly (6). Remove the attenuator.
- (35) Remove eight machine screws (3) and eight lockwashers (4) which secure waveguide assembly (6) to waveguide

assembly (7). Remove the waveguide assembly.

- (36) Remove eight machine screws (8) and eight lockwashers (4) which secure waveguide assembly (7) to waveguide assembly (9). Remove the waveguide assembly.
- (37) Remove eight machine screws (1, fig. 107) and eight lockwashers (2) which secure waveguide termination (3) to directional coupler (4). Remove the waveguide termination.
- (38) Remove eight machine screws (1) and



- 1 — No. 4-40 x 3/8 fil-h machine screw MS35265-15 (52)
- 2 — No. 4 lockwasher MS35338-40 (64)
- 3 — Waveguide termination 8155986
- 4 — Directional coupler 8020942 p/o waveguide assembly 8024108 and waveguide assembly 9156490 p/o waveguide assembly 9144724
- 5 — Waveguide assembly 8020903
- 6 — Waveguide spacer 8010662

- 7 — Attenuator assembly 8617468
- 8 — Waveguide assembly 8020923
- 9 — No. 4-40 x 3/8 hex-hd machine screw 8176241 (6)
- 10 — No. 4-40 x 1 fil-h machine screw 131865 (8)
- 11 — Waveguide assembly 8020918
- 12 — Waveguide spacer 8015625
- 13 — Directional coupler (HY1) 8007729
- 14 — Waveguide assembly 8020919
- 15 — Directional coupler (HY3) 8007729

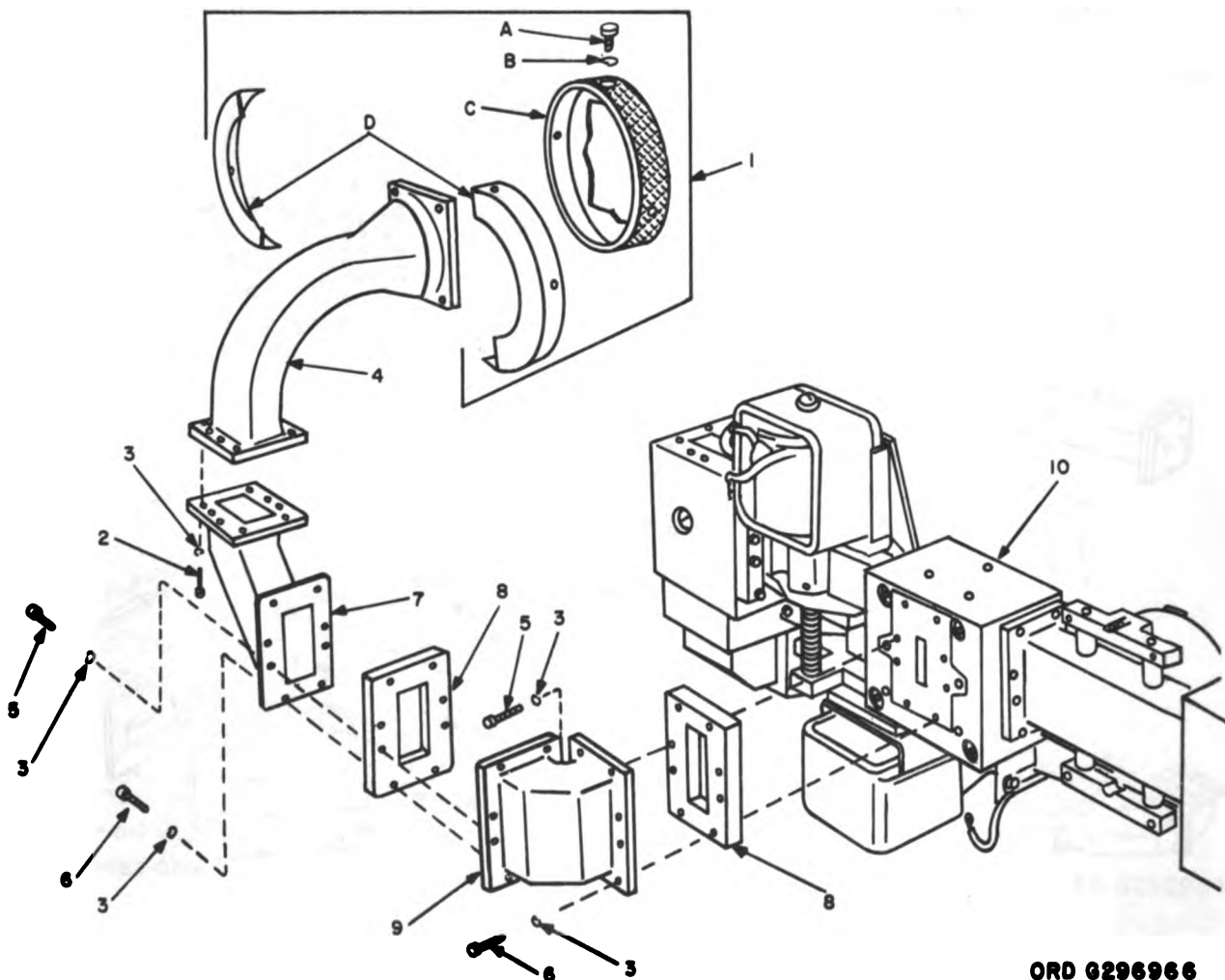
ORD G296985

Figure 107. Waveguide assembly—partially exploded view.

- eight lockwashers (2) which secure one flange of directional coupler (4) to waveguide assembly (5). Remove eight machine screws (1) and eight lockwashers (2). Remove the directional coupler and spacer (6).
- (39) Remove eight machine screws (1) and eight lockwashers (2) and remove waveguide assembly (5).
- (40) Remove eight machine screws (1) and eight lockwashers (2) which secure

attenuator assembly (7) to waveguide assembly (8) and remove the attenuator assembly. Disassemble the attenuator assembly as outlined in *d*(1) below.

- (41) Remove two screws (9), six screws (1), and eight lockwashers (2) and remove waveguide assembly (8).
- (42) Remove six machine screws (10) and six lockwashers (2) and remove waveguide assembly (11).



ORD 0296966

- 1 — Waveguide clamp 8010911
 A — No. 4-40 x 3/16 fil-h machine screw MS35265-12 (4)
 B — No. 4 lockwasher MS35338-40 (4)
 C — Shell 8010908
 D — Shell 8010912 (2)
 2 — No. 4-40 x 3/8 fil-h machine screw MS35265-15 (8)

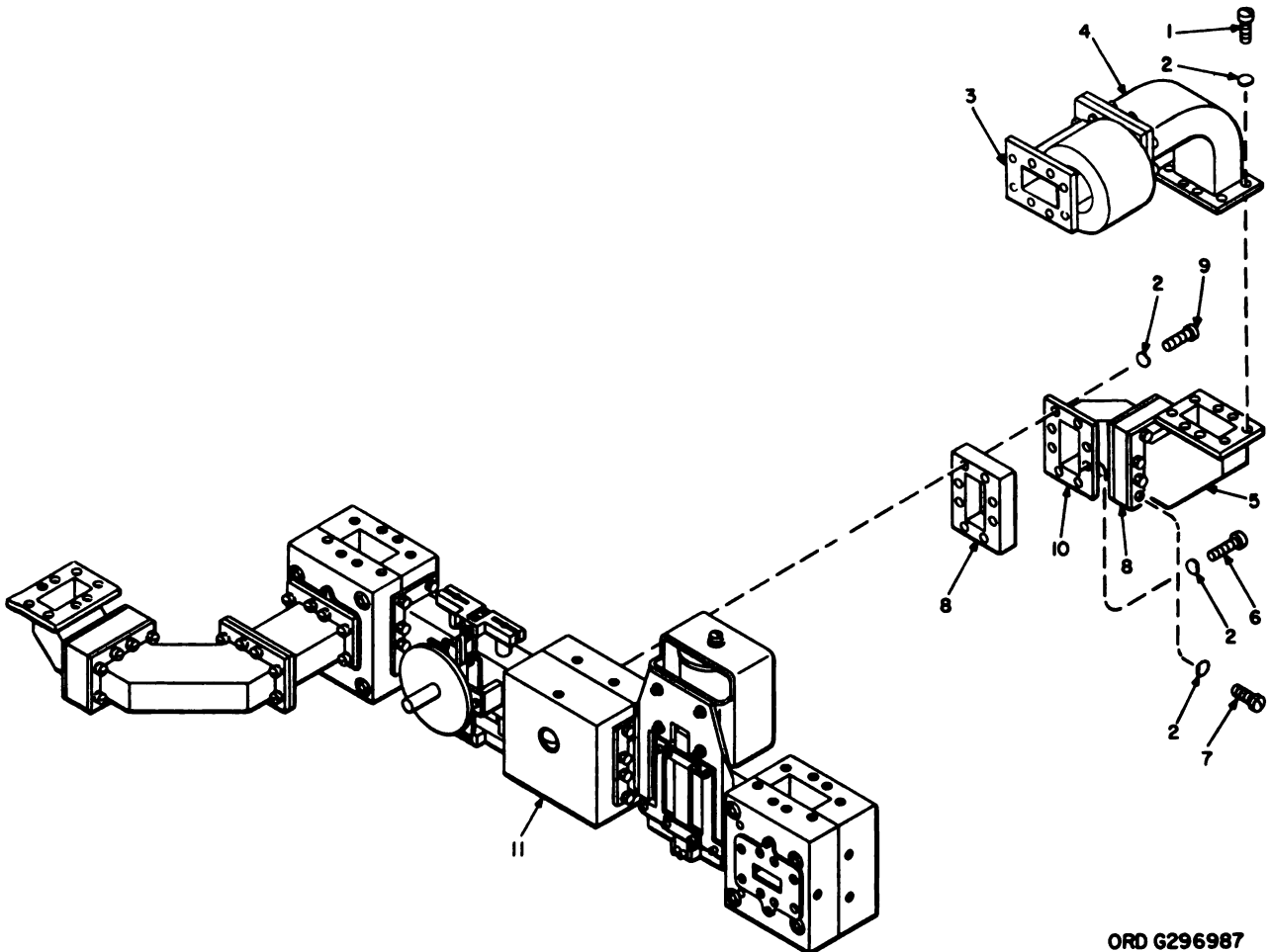
- 3 — No. 4 lockwasher MS35338-40 (24)
 4 — Waveguide assembly 8170500
 5 — No. 4-40 x 3/4 hex-hd machine screw 8023673 (4)
 6 — No. 4-40 x 3/4 fil-h machine screw 181855 (12)
 7 — Waveguide assembly 8020923
 8 — Waveguide spacer 8024118 (2)
 9 — Waveguide assembly 8020918
 10 — Directional coupler (HY2) 8007729

Figure 108. Waveguide assembly 8024108—partially exploded view.

(43) Loosen two machine screws (9) with lockwashers (2) and remove spacer (12) from directional coupler (13). Remove two hexagon-head machine

screws and two lockwashers.

(44) Remove two machine screws (9), six machine screws (1), and eight lockwashers (2) which secure waveguide



ORD G296987

- 1 — No. 4-40 x 3/8 cross-recess pan-hd machine screw MS35206-215 (16)
- 2 — No. 4 lockwasher MS35338-40 (32)
- 3 — RF reflection isolator 9976413
- 4 — Waveguide assembly 9156489
- 5 — Waveguide assembly 8020923
- 6 — No. 4-40 x 3/4 hex-hd machine screw 8020673 (4)

- 7 — No. 4-40 x 3/4 cross-recess pan-hd machine screw MS35206-219 (6)
- 8 — Waveguide spacer 8024118
- 9 — No. 4-40 x 1 cross-recess pan-hd machine screw MS35206-221 (6)
- 10 — Waveguide assembly 8020918
- 11 — Directional coupler (HY2) 8007729

Figure 109. Waveguide assembly 9144724—partially exploded view.

assembly (14) to directional coupler (15). Remove the waveguide assembly.

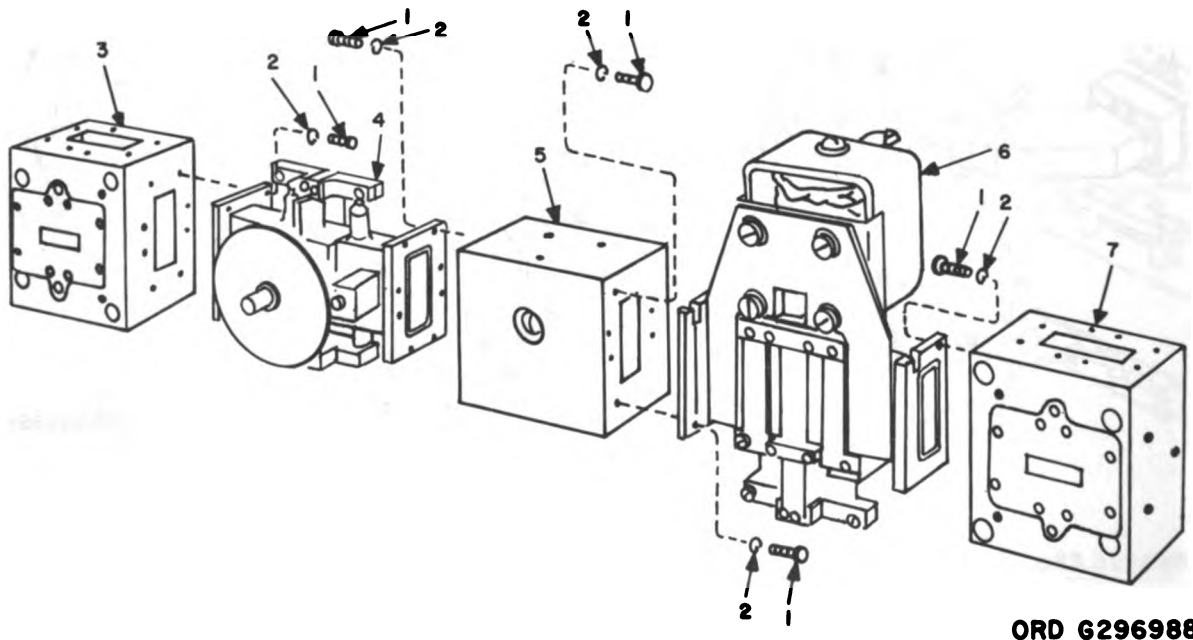
Note. The procedures outlined in (45) through (48) below refer to waveguide assembly 8024108.

- (45) Remove waveguide clamp (1, fig. 108) as outlined in (1) above.
- (46) Remove eight machine screws (2) and eight lockwashers (3) and remove waveguide assembly (4).
- (47) Remove two screws (5), six screws (6), and eight lockwashers (3) and remove waveguide assembly (7) with spacer (8).
- (48) Remove two screws (5), six screws (6), and eight lockwashers (3) and remove waveguide assembly (9) and spacer (8).

Note. The procedures outlined in (49) through (52) below refer to waveguide assembly 9144724.

- (49) Remove eight machine screws (1, fig. 109) and eight lockwashers (2) which secure RF reflection isolator (3) to waveguide assembly (4).

- (50) Remove eight machine screws (1) and eight lockwashers (2) which secure waveguide assembly (4) to waveguide assembly (5).
- (51) Remove two machine screws (6), six machine screws (7), and eight lockwashers (2) and remove waveguide assembly (5) and spacer (8).
- (52) Remove two machine screws (6), six machine screws (9), and eight lockwashers (2) and remove waveguide assembly (10) and spacer (8).
- (53) Remove eight machine screws (1, fig. 110) and eight lockwashers (2) which secure directional coupler (3) to waveguide attenuator (4). Remove the directional coupler.
- (54) Remove eight machine screws (1) and eight lockwashers (2) which secure waveguide attenuator (4) to directional coupler (5). Remove the attenuator.
- (55) Loosen one machine screw (1). Remove seven machine screws and lockwashers (2) which secure directional coupler (5) to attenuator assembly



ORD 6296988

- 1 — No. 4-40 x 3/8 hex-hd machine screw 8176241 (32)
- 2 — No. 4 lockwasher MS35338-40 (32)
- 3 — Directional coupler (HY3) 8007729

- 4 — Waveguide attenuator 8171360
- 5 — Directional coupler (HY2) 8007729
- 6 — Attenuator assembly 8017467
- 7 — Directional coupler (HY1) 8007729

Figure 110. Waveguide assembly—partially exploded view.

(6) and remove the directional coupler. Remove machine screw (1) and lockwasher (2).

- (56) Loosen one machine screw (1). Remove seven machine screws and lockwashers (2) which secure attenuator assembly (6) to directional coupler (7) and remove the attenuator assembly from the directional coupler. Remove machine screw (1) and lockwasher (2). Disassemble the attenuator assembly as outlined in *d*(1) below.

c. Assembly.

- (1) Place one lockwasher (2, fig. 110) and one machine screw (1) in side of directional coupler (7) and turn the screw clockwise two turns. Assemble attenuator assembly (6) as outlined in *d*(2) below. Position the attenuator assembly against the side of the directional coupler. Engage the slot on the flange of the attenuator assembly with the screw already on the directional coupler. Aline the holes and tighten the screw. Secure the attenuator assembly to the directional coupler with seven lockwashers (2) and seven machine screws (1).
- (2) Place one lockwasher (2) and one machine screw (1) in threaded hole of directional coupler (5) and turn the screw clockwise two turns. Engage the screw on the directional coupler with the slot on the flange of attenuator assembly (6). Aline the holes and tighten the screw. Secure the directional coupler to the attenuator assembly with seven lockwashers (2) and seven machine screws (1).
- (3) Position waveguide attenuator (4) against directional coupler (5). Aline the holes and secure with eight lockwashers (2) and eight machine screws (1).
- (4) Position directional coupler (3) against waveguide attenuator (4). Aline the holes and secure with eight lockwashers (2) and eight machine screws (1).

Note. The procedures outlined in (5) through (8) below refer to waveguide assembly 8024108.

- (5) Position spacer (8, fig. 108) on waveguide assembly (9) so that the spacer is against the flange with the unthreaded holes. Position the spacer and the waveguide assembly against the directional coupler (10). Aline the holes and secure with eight lockwashers (3), six machine screws (6), and two machine screws (5).
 - (6) Position spacer (8) and waveguide assembly (7) against waveguide assembly (9). Aline the holes and secure in place with eight lockwashers (3), six machine screws (6), and two machine screws (5).
 - (7) Position waveguide assembly (4) so that the flange with the threaded holes is against waveguide assembly (7). Aline the holes and secure in place with eight lockwashers (3) and eight machine screws (2).
 - (8) Position shell (1C) over the flange of waveguide assembly (4). Position shells (1D) together over the waveguide assembly so that they will fit inside shell (1C) to form a clamp. Slide shells (1D) inside shell (1C). Aline the holes and secure the three shells to each other with four lockwashers (1B) and four machine screws (1A).
- Note.* The procedures outlined in (9) through (12) below refer to waveguide assembly 9144724.
- (9) Position waveguide spacer (8, fig. 109) on waveguide assembly (10) so that the spacer is against the flange with the unthreaded holes. Position the spacer and waveguide assembly against directional coupler (11). Aline the holes and secure with eight lockwashers (2), six machine screws (9), and two machine screws (6).
 - (10) Position spacer (8) and waveguide assembly (5) against waveguide assembly (10). Aline the holes and secure in place with eight lockwashers

- (2), six machine screws (7), and two machine screws (6).
- (11) Position waveguide assembly (4) against waveguide assembly (5). Aline the holes and secure in place with eight lockwashers (2) and eight machine screws (1).
 - (12) Position RF reflection isolator (3) so that the flange with the threaded holes is against waveguide assembly (4). Aline the holes and secure in place with eight lockwashers (2) and eight machine screws (1).
 - (13) Place two lockwashers (2, fig. 107) and two machine screws (9) in the two center front holes on bottom of directional coupler (13) and turn each screw clockwise two turns. Engage the two slots on spacer (12) with the two screws. Aline the holes and tighten the two screws.
 - (14) Position waveguide assembly (11) with the flange with the unthreaded holes against spacer (12). Aline the holes and secure in place with six lockwashers (2) and six machine screws (10).
 - (15) Place waveguide assembly (8) in position against waveguide assembly (11). Aline the holes and secure in place with eight lockwashers (2) and eight machine screws (1).
 - (16) Assemble attenuator assembly (7) as outlined in d(2) below. Place the attenuator assembly in position against waveguide assembly (8). Aline the holes and secure in place with eight lockwashers (2) and eight machine screws (1).
 - (17) Position waveguide assembly (14) so that the flange with the unthreaded holes is against directional coupler (15). Aline the holes and secure in place with eight lockwashers (2), six machine screws (1), and two machine screws (9).
 - (18) Position waveguide spacer (6) and directional coupler (4) against waveguide assembly (14) as shown in figure 107. Aline the holes and secure in place with eight lockwashers (2) and eight machine screws (1).
 - (19) Position waveguide termination (3) against directional coupler (4). Aline the holes and secure in place with eight lockwashers (2) and eight machine screws (1).
 - (20) Place waveguide (5) between attenuator assembly (7) and directional coupler (4). Aline the holes and secure in place with sixteen lockwashers (2) and machine screws (1).
- Note.* The procedures outlined in (21) through (23) below refer to waveguide assembly 8024108.
- (21) Position waveguide assembly (6, fig. 105) so that the flange with the six unthreaded holes and the two threaded holes is against directional coupler (8). Install two lockwashers (4) and two machine screws (7) through the two unthreaded holes of the directional coupler and screw them into the two threaded holes on the waveguide assembly. Tighten the screws. Install six lockwashers (4) and six machine screws (7) through the unthreaded holes in the waveguide assembly and screw them into the threaded holes of the directional coupler. Tighten the screws.
 - (22) Position waveguide assembly (5) against waveguide assembly (6). Aline the holes and secure in place with eight lockwashers (4) and eight machine screws (3).
 - (23) Install gasket (1) on waveguide clamp assembly (2).
- Note.* The procedures outlined in (24) through (28) below refer to waveguide assembly 9144724.
- (24) Position waveguide assembly (7, fig. 106) so that the flange with the six unthreaded holes and the two threaded holes is against waveguide assembly (9). Install two lockwashers (4) and two machine screws (8) through the two unthreaded holes of the waveguide assembly and screw them into the two threaded holes on waveguide assembly (7). Tighten the screws. Install six lockwashers (4) and six machine screws (1).

chine screws (8) through the unthreaded holes in the waveguide assembly and screw them into the threaded holes of waveguide assembly (9) and tighten the screws.

- (25) Position waveguide assembly (6) against waveguide assembly (7). Aline the holes and secure in place with eight lockwashers (4) and eight machine screws (3).
 - (26) Position variable attenuator (5) against waveguide assembly (6) as shown in figure 106. Secure in place with eight lockwashers (4) and eight machine screws (3).
 - (27) Position waveguide clamp assembly (2) against variable attenuator and secure in place with eight lockwashers (4) and eight machine screws (3).
 - (28) Install gasket (1) on waveguide clamp assembly (2).
- Note.* The procedures outlined in (29) through (35) below refer to waveguide assembly 8024108.
- (29) Position waveguide assembly (8, fig. 103) so that the flange with the unthreaded holes is against directional coupler (10). Aline the holes and secure in place with eight lockwashers (3), six machine screws (2), and two machine screws (9).
 - (30) Position waveguide assembly (6) against waveguide assembly (8). Aline the holes and secure in place with eight lockwashers (3) and eight machine screws (2).
 - (31) Position waveguide assembly (7) against waveguide assembly (6). Aline the holes and secure in place with eight lockwashers (3) and eight machine screws (2).
 - (32) Position waveguide assembly (6) against waveguide assembly (7). Aline the holes and secure in place with eight lockwashers (3) and eight machine screws (2).
 - (33) Position waveguide assembly (5) so that the flange with the threaded holes is against waveguide assembly (6). Aline the holes and secure in

place with eight lockwashers (3) and eight machine screws (2).

- (34) Position waveguide assembly (4) so that the flange with the threaded holes is against waveguide assembly (5). Aline the holes and secure in place with eight lockwashers (3) and eight machine screws (2).
- (35) Install waveguide clamp (1) on waveguide assembly (4) following procedures outlined in (8) above.

Note. The procedures outlined in (36) through (43) below refer to waveguide assembly 9144724.

- (36) Position waveguide assembly (9, fig. 104) so that the flange with the unthreaded holes is against directional coupler (11). Aline the holes and secure in place with eight lockwashers (3), six machine screws (2), and two machine screws (10).
- (37) Position waveguide assembly (6) against waveguide assembly (9). Aline the holes and secure in place with eight lockwashers (3) and eight machine screws (2).
- (38) Position RF reflection isolator (8) against waveguide assembly (6). Aline the holes and secure in place with eight lockwashers (3) and eight machine screws (2).
- (39) Position waveguide assembly (7) against RF reflection isolator (8). Aline the holes and secure in place with eight lockwashers (3) and eight machine screws (2).
- (40) Position waveguide assembly (6) against waveguide assembly (7). Aline the holes and secure in place with eight lockwashers (3) and eight machine screws (2).
- (41) Position waveguide assembly (5) so that the flange with the threaded holes is against waveguide assembly (6). Aline the holes and secure in place with eight lockwashers (3) and eight machine screws (2).
- (42) Position waveguide assembly (4) so that the flange with the threaded holes is against waveguide assembly (5). Aline the holes and secure in place

- with eight lockwashers (3) and eight machine screws (2).
- (43) Install waveguide clamp (1) on waveguide assembly (4) following procedures outlined in (8) above.
- (44) Position waveguide assembly (11, fig. 102) so that the flange with the unthreaded holes is against directional coupler (12). Aline the holes and secure in place with eight lockwashers (2) and eight machine screws (4).
- (45) Position waveguide assembly (9) against waveguide assembly (11). Aline the holes and secure in place with eight lockwashers (2) and eight machine screws (1).
- (46) Position waveguide spacer (8) on waveguide assembly (9) so that the waveguide spacer is against the flange with the eight threaded holes. Position the waveguide spacer and the waveguide assembly against waveguide assembly (9). Aline the holes and secure in place with eight lockwashers (2) and eight machine screws (7).
- (47) Position RF detector (5) on waveguide assembly (6). Install two machine screws (1) from the waveguide assembly through the two unthreaded holes on the RF detector and secure with two lockwashers (2) and two hexagon nuts (3) as shown in figure 102. Tighten the nuts on the screws. Install four lockwashers (2) and four machine screws (4) from the waveguide assembly through the threaded holes on the RF detector and tighten the screws.
- (48) Position waveguide assembly (3, fig. 101) so that the flange with the unthreaded holes is against directional coupler (9). Aline the holes and secure with six lockwashers (2) and six machine screws (1).
- (49) Position waveguide spacer (6) and waveguide assembly (7) against waveguide assembly (3). Aline the holes and secure with eight lockwashers (2) and eight machine screws (5).
- (50) Position one flange of waveguide (8) against waveguide assembly (7). Aline the holes and secure with eight lockwashers (2) and eight machine screws (1).
- (51) Position one flange of waveguide assembly (7) against waveguide (8). Aline the holes and secure with eight lockwashers (2) and eight machine screws (1).
- (52) Position waveguide assembly (3) so that the flange with the unthreaded holes is against directional coupler (4). Secure with six lockwashers (2) and six machine screws (1).
- (53) Insert waveguide spacer (6) between the flange of waveguide assembly (3) and the flange of waveguide assembly (7). Secure the spacer to the waveguide assembly flanges with eight lockwashers (2) and eight machine screws (5).
- (54) Position waveguide assembly (8, fig. 100) so that the flange with the unthreaded holes is against directional coupler (9). Aline the holes and secure in place with eight lockwashers (4) and eight machine screws (7).
- (55) Position waveguide assembly (5) against waveguide assembly (8). Aline the holes and secure in place with eight lockwashers (4) and eight machine screws (3).
- (56) Position waveguide assembly (6) against waveguide assembly (5). Aline the holes and secure in place with eight lockwashers (4) and eight machine screws (3).
- (57) Position waveguide assembly (5) against waveguide assembly (6). Aline the holes and secure in place with eight lockwashers (4) and eight machine screws (3).
- (58) Position waveguide assembly (2) so that the flange with the threaded holes is against waveguide assembly (5). Aline the holes and secure in place with eight lockwashers (4) and eight machine screws (3).

- (59) Install waveguide clamp (1) on waveguide assembly (2) following procedures outlined in (8) above.

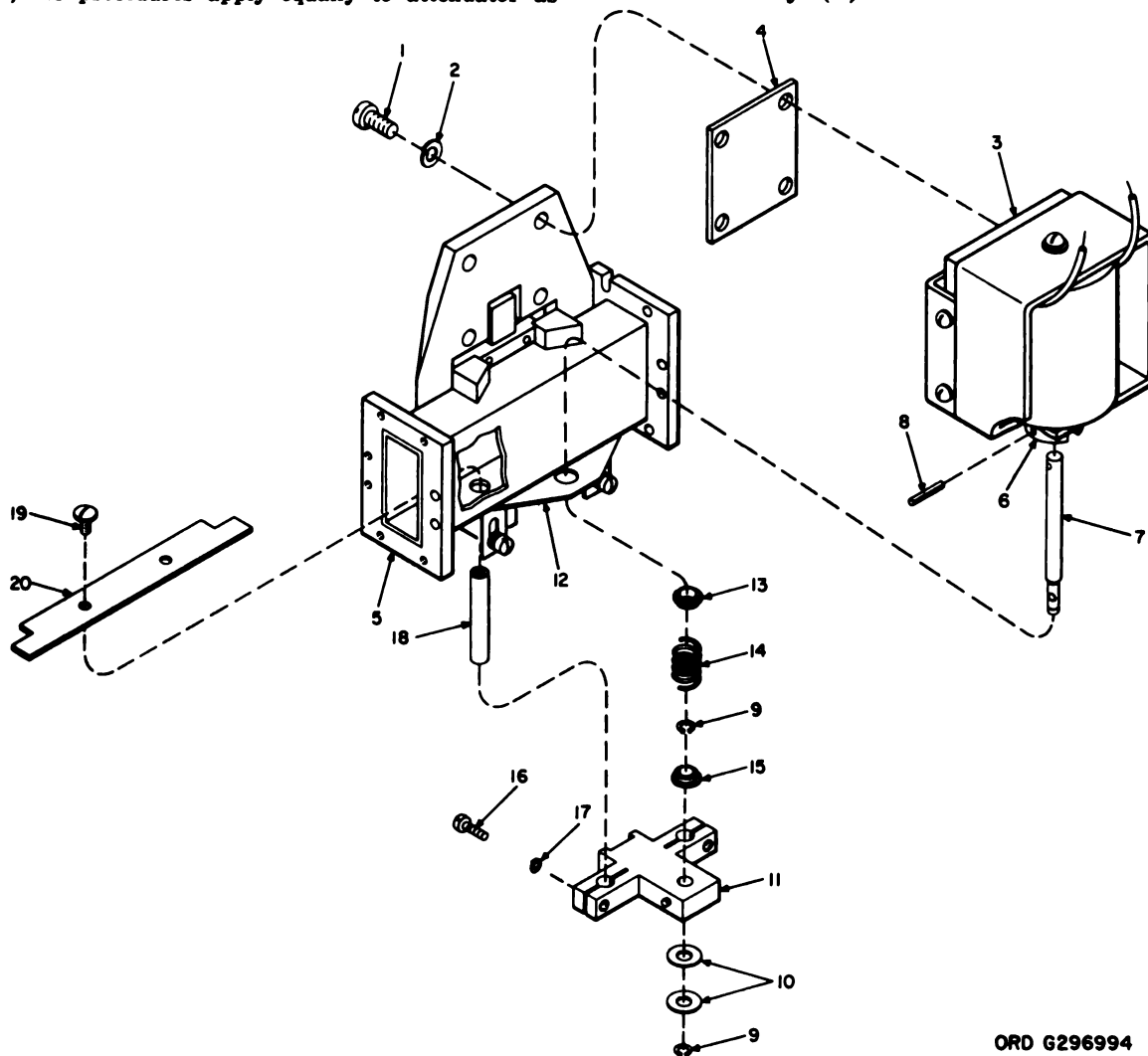
d. Disassembly and Assembly of Attenuator Assemblies 8017467 and 8017468.

Note. The instructions outlined in (1) and (2) below deal specifically with the disassembly and assembly of attenuator assembly 8017467 (6, fig. 110); however, the procedures apply equally to attenuator as-

sembly 8017468 (7, fig. 107).

- (1) Disassemble attenuator assembly 8017467 (6, fig. 110) as outlined in (a) through (g) below.

- (a) Remove four machine screws (1, fig. 111) and four lockwashers (2) and remove solenoid coil (3) and spacer (4) from waveguide assembly (5).



ORD G296994

- 1 — No. 8-32 x 7/16 cross-recess pan-hd machine screw MS35206-244
 2 — No. 8 lockwasher MS35338-42
 3 — Solenoid 8176518
 4 — Spacer 8010937
 5 — Waveguide assembly 9154375 p/o attenuator assembly 8017467, waveguide assembly 9154376 p/o attenuator assembly 8017468
 6 — Solenoid core
 7 — Actuating attenuator rod 8021068
 8 — 5/64-in-dia x 5/8-in-lg spring pin MS16562-205
 9 — Retaining ring 8176074 (2)

- 10 — 5/32-in flat washer MS27183-6 (2)
 11 — Guide yoke 8007478
 12 — Bracket 8021069
 13 — Bushing 8021071
 14 — Spring 8017699
 15 — Bushing 8021070
 16 — No. 2-56 x 7/16 cross-recess pan-hd machine screw MS35206-206
 17 — No. 2 lockwasher MS35338-20
 18 — Spacer rods 8007479
 19 — No. 4-40 x 3/16 bind-hd machine screw 585802
 20 — Waveguide vane 8007480

Figure 111. Attenuator assembly—exploded view.

- (b) Remove solenoid core (6) from actuating attenuator rod (7) by removing spring pin (8).
 - (c) Remove one retaining ring (9) and two flat washers (10) from actuating attenuator rod (7). Remove actuating attenuator rod (7) by sliding it away from guide yoke (11) through bracket (12). Remove remaining retaining ring (9) from actuating attenuator rod.
 - (d) Remove bushing (13), spring (14), and bushing (15) from guide yoke (11) and bracket (12).
 - (e) Remove two machine screws (16) and two lockwashers (17) and remove guide yoke (11) from waveguide assembly (5) and attached spacer rods (18).
 - (f) Hold two binding-head machine screws (19) stationary, turn two spacer rods (18) counterclockwise until they are free from the screws, and remove the rods from waveguide assembly (5).
 - (g) Slide waveguide vane (20) and two attached machine screws (19) from the waveguide assembly and remove the two screws from the waveguide vane.
- (2) Assemble attenuator assembly (AT3) 8017467 (6, fig. 110) as outlined in (a) through (h) below.
- (a) Insert two machine screws (19, fig. 111) through waveguide vane (20) and insert waveguide vane and attached screws into waveguide assembly (5).
- Note.* Install vane so that its carbon face contacts spacer rods.
- (b) Aline the two machine screws with holes in waveguide assembly (5) and insert two spacer rods (18) through holes in the waveguide. Hold the two machine screws stationary and turn two spacer rods (18) clockwise until the spacer rods are firmly attached.
 - (c) Install guide yoke (11) on waveguide assembly (5). Insert spacer rods (18) into the guide yoke and secure the yoke in place with two lockwashers (17) and two machine screws (16).
- Note.* Apply sealing compound MIL-S-7502 to ends of rods and to ends of yoke and apply antiseize compound TT-A-580 to threads of screws.
- (d) Install bushing (13), spring (14), and bushing (15) between holes in guide yoke (11) and bracket (12).
 - (e) Place one retaining ring (9) into inside groove on attenuator rod (7) and insert rod through bracket (12), bushing (13), spring (14), bushing (15), and guide yoke (11).
 - (f) Place two flat washers (10) on attenuator rod (7) and secure them in place with retaining ring (9).
 - (g) Secure solenoid core (6) to attenuator rod (7) with one spring pin (8).
 - (h) Insert the solenoid core (6) into solenoid (3) and place spacer (4) and solenoid (3) on waveguide assembly (5) and secure parts together with four lockwashers (2) and four machine screws (1).
- e. Installation.* Install waveguide assembly (29, fig. 95) following the procedures outlined in paragraph 190d.

192. Final Test and Installation of Radar Test Set Waveguide Assembly or Test Set Subassembly

a. Test the radar test set waveguide assembly as outlined in TM 9-1400-250-35/5/1 and test set subassembly as outlined in TM 9-1400-250-35/5/3.

b. Install radar test set waveguide assembly or test set subassembly as instructed in paragraph 150.

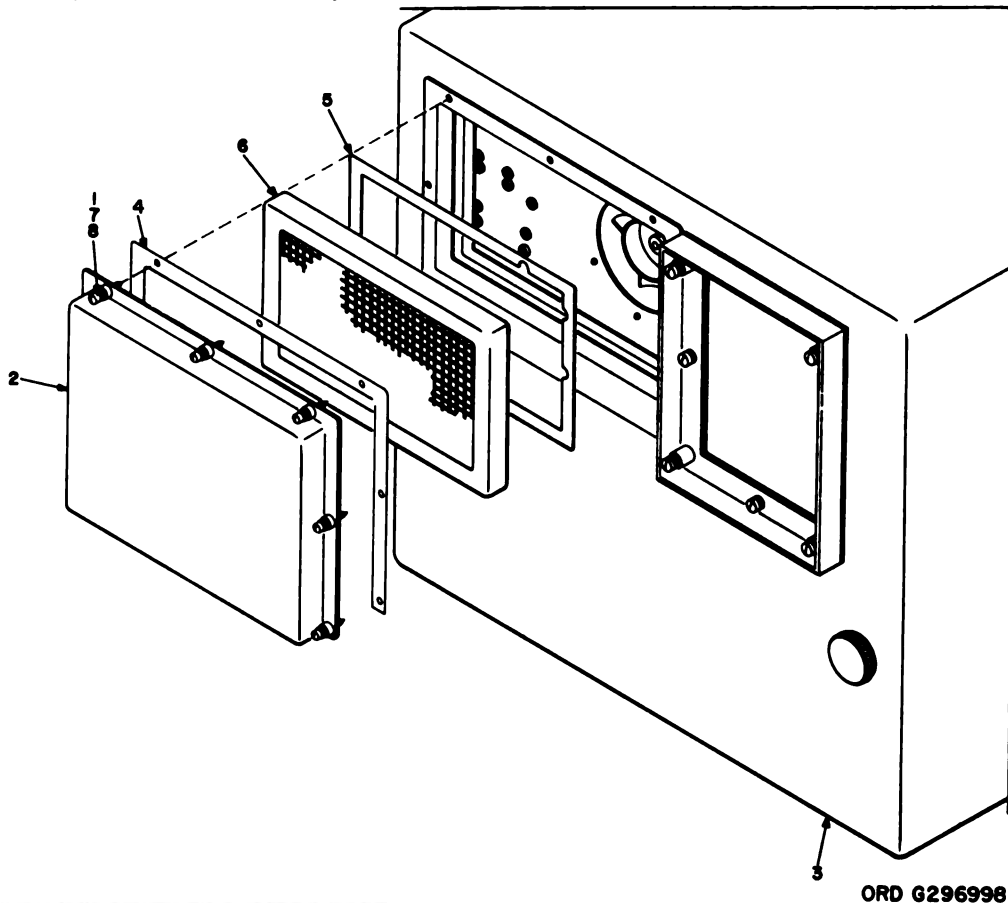
Section XIII. MAINTENANCE OF MISCELLANEOUS COMPONENTS OF RADAR TEST SET

193. Maintenance of Electrical Equipment Cabinets 8024188 and 9143813

a. Removal. Remove equipment drawer from electrical equipment cabinet following procedures outlined in paragraph 141.

b. Disassembly.

- (1) Unscrew seven externally-relieved body screws (1, fig. 112) which secure the hood assembly (2) to cabinet (3). Remove the hood assembly (2), two gaskets (4 and 5), and one air filter (6).
- (2) Pull each externally-relieved body screw against hood assembly and rotate the screw counterclockwise until it is free from the hood assembly. Remove one flat washer (7) and one lockwasher (8) from each screw.
- (3) Unscrew six externally-relieved body screws (1, fig. 113) and remove plate assembly (2), air filter (3), and gasket (4) from cabinet (5).
- (4) Pull each externally-relieved body screw (1) against plate assembly (2) and rotate the screw counterclockwise until it is free from the plate assembly. Remove one flat washer (6) and one lockwasher (7) from each screw.
- (5) Unsolder wire leads on thermostatic switch (8) from terminal board (9)



- 1—No. 8-32 x 27/32 externally-relieved body screw 8024174 (7)
 2—Hood assembly 8024177
 3—Electrical equipment cabinet 8024188 p/o radar test set 8024190, electrical equipment cabinet 9143813 p/o radar test set 9143816

- 4—Gasket 8024170
 5—Gasket 8024169
 6—Air filter 8176977
 7—3/16-in-id flat washer MS15795-807 (7)
 8—No. 8 lockwasher MS35338-42 (7)

ORD G296998

Figure 112. Electrical equipment cabinet—partially exploded rear view.

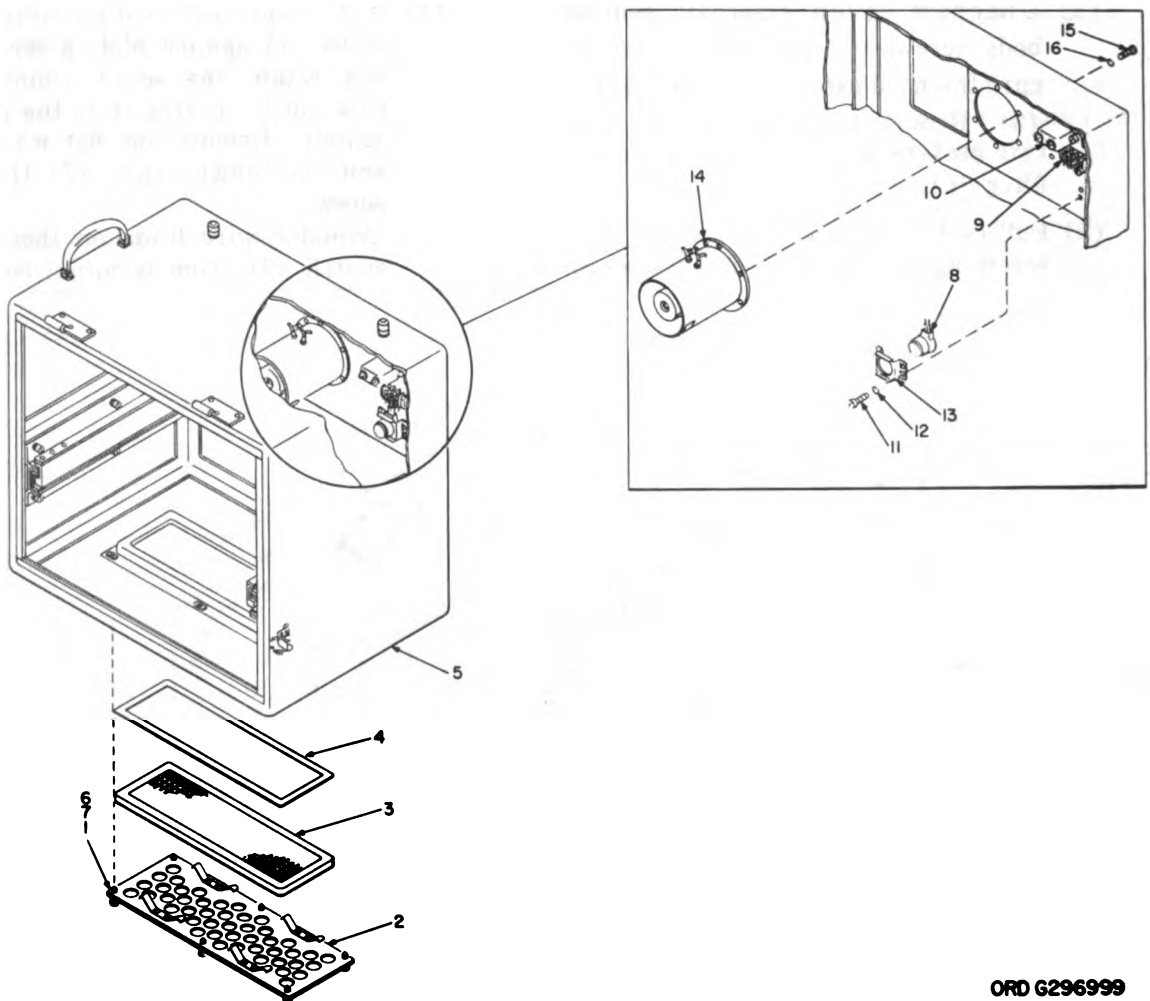
and from fixed capacitor (10). Unscrew and remove four machine screws (11) and four lockwashers (12), and remove bracket (13) and the thermostatic switch from the cabinet.

- (6) Unsolder wire leads on vaneaxial fan (14) from fixed capacitor (10) and terminal board (9). Unscrew and re-

move six machine screws (15) and six lockwashers (16) which secure the fan to the cabinet, and remove the fan.

c. Assembly.

- (1) Place vaneaxial fan (14, fig. 113) in position against the cabinet. Secure in place with six lockwashers (16) and six machine screws (15). Solder



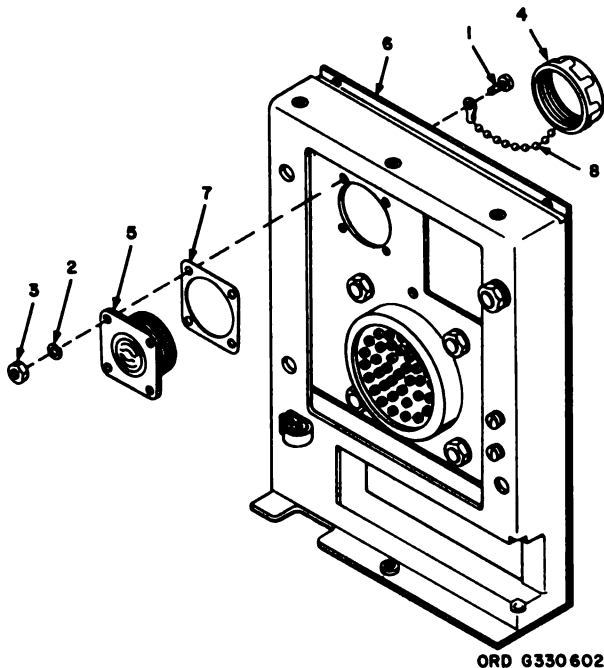
ORD G296999

- 1 — No. 8-32 x 21/32 externally-relieved body screw 8024166 (6)
- 2 — Plate assembly 8024175
- 3 — Air filter 8176976
- 4 — Gasket 8024168
- 5 — Electrical equipment cabinet 8024188 p/o radar test set 8024190, electrical equipment cabinet 9143813 p/o radar test set 9143816
- 6 — 3/16-in-id flat washer MS15795-807 (6)
- 7 — No. 8 lockwasher MS35338-42 (6)
- 8 — Thermostatic switch 7610305

- 9 — Terminal board 8176996
- 10 — Fixed capacitor 8176483
- 11 — No. 6-32 x 1/4 cross-recess pan-hd machine screw MS35206-226 (4)
- 12 — No. 6 lockwasher MS35338-41 (4)
- 13 — Bracket 8024236
- 14 — Vaneaxial fan 8024438
- 15 — No. 10-32 x 5/16 cross-recess pan-hd machine screw MS35207-260 (6)
- 16 — No. 10 lockwasher MS35338-43 (6)

Figure 113. Electrical equipment cabinet—partially exploded view.

- (7) Place one lockwasher (8) and one flat washer (7) on each of seven externally-relieved body screws (1). Install the seven screws with their washers on hood assembly (2).
- (8) Place the hood assembly with gasket cemented to it on the cabinet and secure with the seven externally-relieved body screws on the hood assembly.



- ORD 6330602
- 1 — No. 4-40 x 3/8 pan-hd machine screw 9157788-26 (4)
 - 2 — No. 4 lockwasher MS35338-40 (4)
 - 3 — No. 4-40 hex nut MS35649-42 (4)
 - 4 — Electrical connector cover 7226521
 - 5 — Receptacle connector 8531069
 - 6 — Marked panel 8024183
 - 7 — Gasket 8024180

Figure 115. Bracket group and associated parts—
exploded view.

d. Installation. Install equipment drawer in electrical equipment cabinet following procedures outlined in paragraph 158.

194. Maintenance of Bracket Group

a. Removal. Remove equipment drawer from electrical equipment cabinet following procedures outlined in paragraph 141.

b. Disassembly.

- (1) Remove one machine screw (1, fig. 115) with lockwasher (2) and hexagon nut (3) which secure cover (4) in position, and unscrew and remove the cap from receptacle connector (5).
- (2) Remove three remaining machine screws (1) with lockwashers (2) and hexagon nuts (3) which secure receptacle connector (5) in position on marked panel (6) and remove the connector and gasket (7).

c. Assembly.

- (1) Cement gasket (7) to receptacle connector (5) with sealing compound MIL-S-7502.
- (2) Align holes and install receptacle connector in bracket group.
- (3) Position chain clip on cover (4) against marked panel (6) and secure the chain and cover to the panel and connector with one machine screw (1), one lockwasher (2), and one hexagon nut (3).
- (4) Secure the connector to the panel with three remaining machine screws (1), three lockwashers (2), and three hexagon nuts (3).

d. Installation. Install equipment drawer into electrical equipment cabinet following the procedures outlined in paragraph 158.

CHAPTER 7

SPECIAL PURPOSE KITS

Section I. INSTALLATION AND REMOVAL OF SPECIAL PURPOSE KITS 1430-799-8679 AND 1430-051-2916

195. Purpose

The purpose of this kit is to increase the ability of the missile tracking, target tracking, and target ranging antenna-receiver-transmit-

ter groups to operate effectively during severe winds by adding antenna pedestal fairings to each of the antennas.

196. Parts Required

Description	Part no.	Federal stock no.	Qty
KIT, SPECIAL PURPOSE: for missile tracking antenna-receiver-transmitter group OA-1485/MPA (GS-18132) 8016525 and target tracking antenna-receiver-transmitter group OA-1488/MPA (GS-18133) 8019240 or OA-1488A/MPA (GS-57673) 9141206 Consisting of:	5950939	1430-799-8679	1
FAIRING, ANTENNA PEDESTAL: GS-64015 Consisting of:	9156220		4
BRACKET, mounting	9156188		3
BRACKET, mounting	9156189		12
COVER, segment antenna	10167496		1
ROD, reinforcing cover	9156162	1430-794-9976	1
SCREW, MACHINE: pan-hd, S, cd- or zn-pltd, 1/4-20UNC-2A x 1	MS35225-83	5305-558-3679	18
SCREW, MACHINE: pan-hd, S, cd- or zn-pltd, 1/4-20UNC-2A x 1-1/4	MS35225-84	5305-531-9418	4
SCREW, MACHINE: pan-hd, S, cd- or zn-pltd, 1/4-20UNC-2A x 1-3/4	MS35225-86		4
GAGE, positioning	9986041		1
KIT, SPECIAL PURPOSE: for target ranging antenna-receiver-transmitter group OA-3390/MPA (GS-56714) 9012664 Consisting of:	5956524	1430-051-2916	1
FAIRING, ANTENNA PEDESTAL: GS-65858 Consisting of:	9156232		2
BRACKET, mounting	9156188		3
BRACKET, mounting	9156189		12
COVER, segment antenna	9156233	1430-056-4785	1
ROD, reinforcing cover	9156162	1430-794-9976	1
SCREW, MACHINE: pan-hd, S, cd- or zn-pltd, 1/4-20UNC-2A x 1-1/4	MS35225-84	5305-531-9418	30
GAGE, positioning	9986041		1
			112.69

197. Disposition of Excess Parts and Materials

Retain all parts removed during the installation of the special purpose kit. They will be required when the kit is removed.

198. Installation of Antenna Pedestal Fairings to Increase Aerodynamic Characteristics of the Missile Tracking, Target Tracking, and Target Ranging Antenna-Receiver-Transmitter Groups

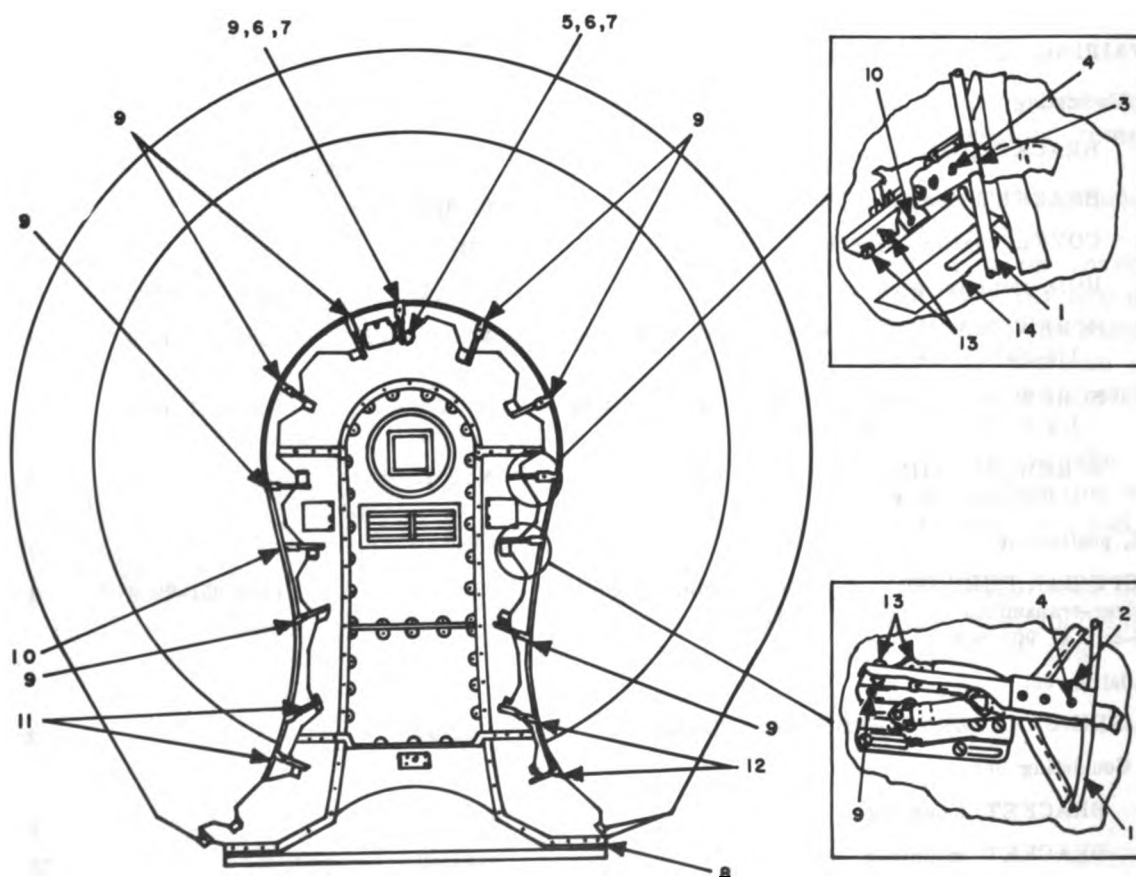
Warning: Set the ANTENNA DISABLE-NORMAL switch on the curbside of the azimuth drive equipment enclosure to the ANTENNA DISABLE position.

a. Rest the rod (1, fig. 116) on a flat surface and slide 3 mounting brackets (2) and 12 mounting brackets (3) into the positions on the rod as shown.

b. Tighten screw (4) on each mounting bracket.

Note. The mounting brackets must be located on the rod as shown on figure 116 before the rod assembly can be installed on the antenna pedestal.

c. Remove two screws (5), two lockwashers (6), and two flat washers (7) located on the far side of the upper tensioning device. Place the two screws in a safe storage area, and retain the two lockwashers and two flat washers.



ORD 6330665

Figure 116. Missile tracking, target tracking, or target ranging antenna-receiver-transmitter group—partial view showing the mounting of reinforcing cover rod 9156162.

- 1—Reinforcing cover rod 9156162
- 2—Mounting bracket 9156188 (3)
- 3—Mounting bracket 9156189 (12)
- 4—No. 10-24 x 5/8 pan-hd machine screw MS35206-264 (15)
- 5—1/4-20 x 7/8 pan-hd machine screw MS35225-82 (22)
- 6—1/4 in. lockwasher (30)
- 7—1/4 in. flat washer (30)
- 8—Radome frame

- 9—1/4-20 x 1 pan-hd machine screw MS35225-83 (18)
- 10—1/4-20 x 1-1/4 pan-hd machine screw MS35225-84 (4)
- 11—1/4-20 x 1-3/4 pan-hd machine screw MS35225-86 (4)
- 12—1/4-20 x 1-1/2 pan-hd machine screw MS35225-85 (4)
- 13—1/4 hex-soc-hd screw (30)
- 14—Positioning gage 9986041

Figure 116. Missile tracking, target tracking, or target ranging antenna-receiver-transmitter group—partial view showing the mounting of reinforcing cover rod 9156162—legend.

d. Position the reinforcing rod assembly prepared in *a* and *b* above to the radome frame (8) and secure the top center mounting bracket to the two holes vacated in *c* above, using two screws (9), and two lockwashers and two flat washers retained in *c* above.

e. Remove 2 screws, 2 lockwashers, and 2 flat washers from the 14 remaining tensioning devices. Place 20 screws (5) and 4 screws (12) in a safe storage area. Retain 4 pan-head screws (10), 28 lockwashers, and 28 flat washers.

f. Alternating from side to side of the radome frame (8), secure the remaining mounting brackets (2 and 3) to the frame at the holes vacated in *e* above. Use two screws, two lockwashers, and two flat washers as specified on figure 116 for securing each mounting bracket. Do not completely tighten the screws at this time.

g. Adjust the rod assembly with relation to the radome frame (8) as follows:

- (1) Adjust the reinforcing rod circumferentially by shifting the rod through the rod retainers until the two ends of the rod are equidistant in height from a predetermined horizontal reference plane.
- (2) Loosen the two hexagon socket-head screws (13) which hold together the two angle brackets, components of mounting brackets (2 and 3). Set the reinforcing rod to the positioning gage (14) as shown on figure 116. Starting at the top of the radome frame and working down both sides alternately, gage the rod at each mounting bracket.
- (3) When the rod has been set to the positioning gage at each of the mounting brackets, tighten the screws securing the angle brackets loosened in

(2) above, and the screws installed in *f* above.

- (4) After the rod has been adjusted and secured, recheck the adjustment outlined in (1) and (2) above to determine that no slippage has occurred during the tightening procedure of (3) above.

h. Turn all the fasteners of segment antenna cover (fig. 117) fully counterclockwise and place the cover into position on the radome frame as shown.

Note. The clips on the two uppermost fasteners of the cover must be located over the top of the rod.

i. Tighten the two top fasteners of the cover (fig. 117) to the reinforcing rod by turning the fasteners in a clockwise rotation. Press the bottom of the cover against the radome frame to get preliminary alinement.

Note. If the fasteners of the cover do not catch over the reinforcing rod when tightening, do not continue to tighten but return the fastener to the counterclockwise position, and adjust the lock fastener (fig. 117) as shown until the lip of the locking bar alines with the reinforcing rod. Resume the tightening procedure.

j. Beginning at the top of the cover and working to the bottom by alternating from left to right, tighten the remaining 13 fasteners.

Note. The installer may observe the tightening procedure from the bottom of the cover to insure that the fasteners catch over the rod.

k. Observe the fit of the cover to the radome frame. If the cover does not fit snugly against the radome frame, remove the cover and adjust the individual mounting bracket by loosening the two pan-head screws (9, 10, 11, or 12, fig. 116) and the two hexagon socket-head screws (13). Adjust the mounting bracket inward or outward as necessary to obtain the desired fit. Tighten all screws after each adjustment.

l. Repeat the procedure of *k* above until

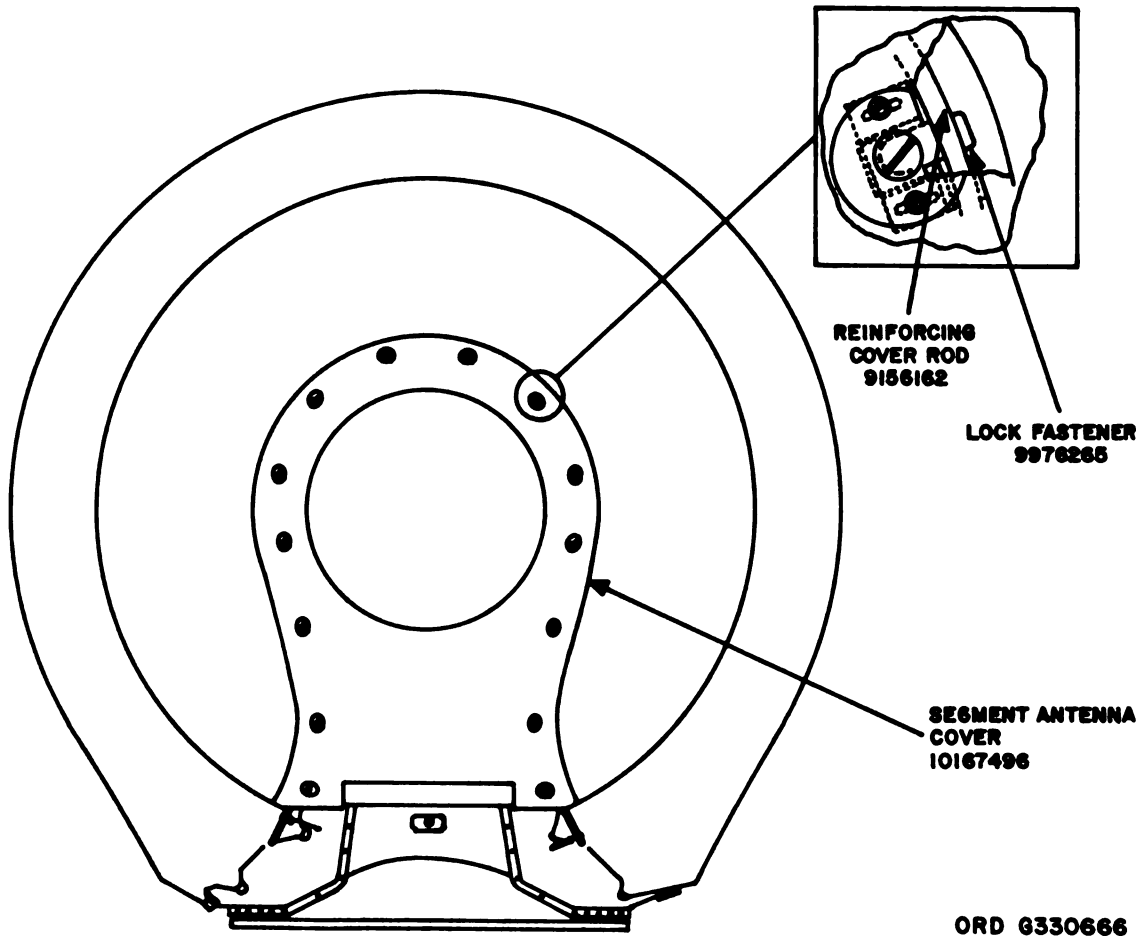


Figure 117. Missile tracking, target tracking, or target ranging antenna-receiver-transmitter group—partial view showing antenna segment cover in place.

the cover fits snugly against the radome frame at all points.

m. Repeat the installation procedures outlined in a through l above to install fairing on the opposite side of the antenna-receiver-transmitter group.

n. Operate the ANTENNA DISABLE-NORMAL switch to the NORMAL position.

199. Removal of Special Purpose Kits 1430-799-8679 and 1430-051-2916

Warning: Set the ANTENNA DISABLE-NORMAL switch on the curbside of the azimuth drive equipment enclosure to the ANTENNA DISABLE position.

a. Turn all the fasteners of segment antenna cover (fig. 117) fully counterclockwise and re-

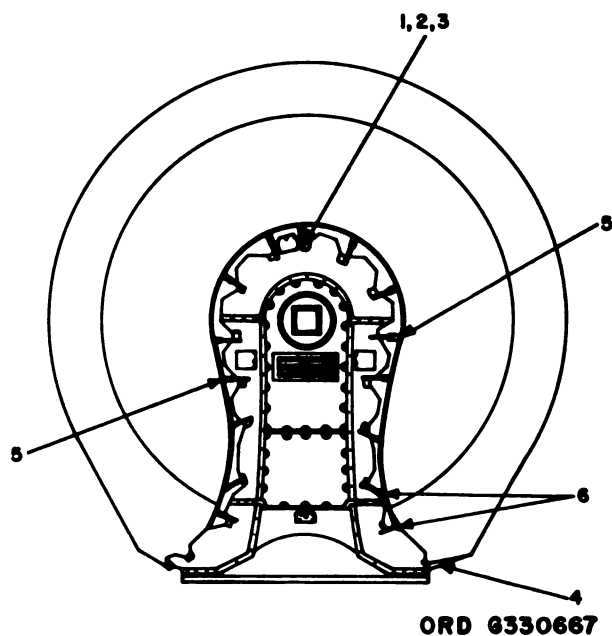
move the cover from the radome frame as shown.

b. Remove 2 screws, 2 lockwashers, and 2 flat washers from the 15 tensioning devices as shown on figure 116. Remove the reinforcing cover rod (1) with its mounting brackets from the radome frame. Retain lockwashers (6) and flat washers (7). Also retain screws (10) and screws (12).

c. Secure the tensioning devices to the radome frame as shown on figure 118.

d. Loosen machine screw (4, fig. 116) on each of the mounting brackets (2 and 3). Remove the brackets from the reinforcing cover rod (1).

e. Retain the rod, mounting brackets, and all other unused hardware. Place them in a safe storage area.



- 1 — 1/4-20 x 7/8 pan-hd machine screw
MS35225-82 (22)
- 2 — 1/4 in. lockwasher (existing) (30)
- 3 — 1/4 in. flat washer (existing) (30)
- 4 — Radome frame

- 5 — 1/4-20 x 1-1/4 pan-hd machine screw
MS35225-84 (4)
- 6 — 1/4-20 x 1-1/2 pan-hd machine screw
MS35225-85 (4)

Figure 113. Missile tracking, target tracking, or target ranging antenna-receiver-transmitter group—partial view showing the antennas with special purpose kits 1430-799-8679 and 1430-051-2916 removed.

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By Order of *Wilber M. Brucker*, Secretary of the Army:

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Chief of Staff.

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Major General, United States Army,
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NG: None.

USAR: None.

For explanation of abbreviations used, see AR 320-50.



